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Diary Dates.

The Spring Conference. 8-10 April 1994.
The George Hotel, Nottingham.

8April 1994.

Friday,	Afternoon	Registration.
	7.00 pm.	Dinner.
	After Dinner	"The History of Jesse Boot" by Prof. S.D.Chapman of the University of Nottingham.

9 April 1994

Saturday	9.30 am.	"Professor Trease: the man and his work" by Dr W.E.Court.
	10.15 am.	"Medical fiction and pharmaceutical facts about Theriac" by Dr A.I.Bierman.
	11.00 am.	Coffee
	11.30 am.	"Some early London physic gardens" by Dr J. Burnby.
	12.30 pm.	Lunch.
	2.30 pm.	Visit to Boot's Museum.
	7.00 pm.	Dinner.

10 April 1994

Sunday	9.30 am.	Annual General Meeting.
	10.15 am.	"Medicines from animal sources" by Mr K.Holland.
	11.00 am.	Coffee
	11.30 am.	"Derby General Infirmary, 1810-1891" by Dr V.M. Leveaux, FRCP.
	12.30 pm.	Lunch.

The Conference fee, everything inclusive is £120, a modest sum for 1994 and is due to the excellent work of our Treasurer Mrs Enid Lucas-Smith.

Society Members' Activities.

Mrs Mary Briggs who is Honorary General Secretary of the Botanical Society of the British Isles has sent us a press release she has received from National Museums & Galleries on Merseyside. The Liverpool Museum has acquired the pharmacognosy specimens of the late Liverpool Polytechnic,now John Moore University, and has incorporated them into the Department of Botany's Economic Botany collection.

Mr Leslie Matthews in October 1993 travelled to Asti in Italy in order to attend the meeting of the Congresso Nationale di Storia della Farmacia. The Italians were delighted to see him again and gave him a great reception.

At almost the same time Miss Ann Hutton and Dr Nita Burnby crossed over to the Hook of Holland where they were met by Dr Annet Bierman and all three drove to Ghent, Belgium where they attended the autumn meeting of the Benelux society. On the Sunday morning Dr Bierman gave a paper on Guaiacum, the concluding part of which she kindly gave in English for the benefit of the two visitors.

"Lignum Guiaci was introduced into Europe at the beginning of the 16th. century. It is still in use today but has totally different purposes. At the time of its introduction the wood was warmly welcomed as a valuable therapeutic agent in the cure of syphilis. Guiacum therapy pushed

1848

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aside mercury therapy but only for a period of about thirty years. About 1530 nobody really believed anymore that guiacum was of any use in the treatment of syphilis, but nevertheless the drug was incorporated in the European pharmacopoeias. It is remarkable that there have even been two revivals of the use of guiacum as an anti-syphilitic drug, one in the 17th. century and the other at the beginning of the 19th. century. Guiacum wood is very hard and it has therefore also been used to make pestles and mortars for the pharmacy. Today it is still in use as a diagnostic agent for tracing hidden blood. Ladies and gentlemen, you will understand that within nearly half an hour I could only tell you in brief about guiacum and its uses. For those who like to know all about it, I recommend strongly the book *Lignum Sanctum*: *Holy Wood,* written in 1990 by Patricia Vöttiner-Pletz. It is,in my opinion,a real masterpiece, it gives many facts and Mrs Vöttiner is a talented writer so that her book makes fascinating reading."

On 2 December 1993 Dr D. Wittop Koning of Amsterdam was inaugurated as the eighth holder of the George Sarton Memorial Chair of the History of Sciences at Ghent University. This is a very considerable honour and BSHP sends its congratulations to him.

Pharmacopoeias and Formularies by Harkishan Singh has been published this year as volume I of the "History of Pharmacy in India and related Aspects" series. The book discusses the *London and Edinburgh Pharmacopoeias* and the beginning of the *British Pharmacopoeia,* as well as the birth and demise of the Pharmacopoeia of India (1868)

It is obtainable from The Vallabh Prakashan, SU-221 Pitam Pura, Delhi 110034, India. Price $35.

THE HISTORY OF PHARMACY COMMITTEE.

This committee of the Pharmaceutical Society, of which BSHP is the lineal descendent, worked from 1952 to 1967. It produced reports, surveys and newsletters but as they seem to have had only a limited circulation they have been lost to view. It is proposed that from time to time the Historian will publish extracts from this material so that the Committee's work will be more widely known.

From a report of 14 September 1956 on material submitted for examination.

"Mr J.R.Dale, the Inspector, has submitted particulars of a collection of old medical and pharmaceutical textbooks in the possession of Mr C.C.Hadfield of 1, Mill Street, Macclesfield. At Mr Dale's request we have been lent a bound "King's Printers" copy of the 1815 Apothecaries' Act, and also a "Bayley's Arsenic Register pursuant to the Act,14 Vic. cap.13" published in 1851 by John Bayley, Medical Label Printers, John Dalton Street, Manchester.

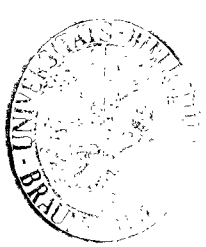
This is the only example which has come to light of a register kept under the Arsenic Act,1851, the first Act to control the sale of a poisonous substance in this country. The act required the vender to keep a register, in a form set out in a schedule to the Act, of all sales of arsenic. The entries were to be signed by the purchaser and a witness "unless such purchaser profess to be unable to write (in which case the person making the entries hereby required, shall add to the Particulars, to be entered in relation to such sale, the words 'cannot write'.)" The Act required the vender to mix with the arsenic before the sale was effected "soot or indigo, in the Proportion of one ounce of soot or half an ounce of indigo at the least, to one pound of arsenic.

The register shows entries which date from December 13,1851 to March 8, 1877. The frequency with which sales were made is as follows:

1851 (from Dec.13 only)	2 sales	1864	17 sales
1852	41	1865	15
1853	45	1866	17
1854	27	1867	17
1855	25	1868	17
1856	37	1869	7
1857	35	1870	26
1858	48	1871	19
1859	34	1872	25
1860	23	1873	21
1861	16	1874	12
1862	28	1875	12
1863	22	1876	14
1877 (to March 8 only)	2		

The quantity sold was most frequently given by cost, that is, 2d.,3d. etc. Larger sales to farmers for the dressing of sheep were recorded in ounces; sales up to 1 lb. weight were not uncommon. The stated purpose for which the smaller quantities were required vary, but the majority were for destroying rats, mice, fleas and bugs.

The recorded occupations of the purchasers are interesting and include: cap maker, silk worker, whitewasher, weaver, dyer, ropemaker, pot dealer, silk-man, silk winder, silk spinster, closser[sic], overlooker, eating-house keeper and fish hawker."



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THE DEVELOPMENT OF AN INTERNATIONAL BUSINESS INFORMATION SERVICE FOR THE PHARMACEUTICAL INDUSTRY.

Dr P.J. Brown.

In this paper Dr Philip Brown described the origins of the pharmaceutical publications produced by PJB Publications Ltd., in particular *Scrip World Pharmaceutical News (Scrip)* and *Pharmaprojects*. "These publications came into existence in recent times, 21 years in the case of *Scrip,* and 14 years for *Pharmaprojects*. The historical significance of the two publications will have to be judged by those who have yet to be born. Whether they will consider the matter worthy of historical study, either in their own right or in the context of pharmacy publishing as a general subject, we here today will never know."

"*Scrip* is a twice-weekly, English language news publication that is subscribed to by pharmaceutical companies and other organisations which are concerned with the worldwide pharmaceutical industry. Currently there are readers at over 8,000 subscribing sites in 85 countries. Pharmaceutical companies constitute the largest group of subscribers, around 70%, with the remainder coming from government regulatory bodies and agencies, the finance community, consultancy companies and other support services to the industry, and academic institutions. *Scrip* is not written for those who provide medical services to the patient; doctors, pharmacists and nurses are not served by *Scrip*. It provides news about all aspects of the worldwide market for pharmaceutical products, currently valued at around $200 billion a year. It reports on political happenings, company events, pharmaceutical products in R.& D. and in everyday use, and about the people involved."

"*Pharmaprojects* is a regularly updated database which tracks the progress of pharmaceutical compounds through the research and development pipeline. Its coverage, like *Scrip*, is worldwide and in English. At any one time, there are over 6,000 products under surveillance in *Pharmaprojects*. For each one there is a monograph up to 500 words long that summarises the current scientific and commercial state of the new drug candidate. If and when research on a candidate is discontinued, the data on that compound is retained in a file which we call *Pharmaceased*. At this time we have some 8,500 compounds in *Pharmaceased*, 6,000 in *Pharmaprojects* and 1,500 in a launched compounds file. *Pharmaprojects* and *Pharmaceased* are available as weekly-updated electronically-searchable databases. *Pharmaprojects* also appears in a monthly updated printed publication, and *Pharmaceased* is printed annually. Like *Scrip,* it is the leading source of this kind of drug R.& D. information, and has over a 1,000 subscribers worldwide, principally in pharmaceutical companies and research institutes."

"The basic editorial objective of the two publications is to provide unbiased, factual information to executives who are concerned with the development, manufacture and marketing of pharmaceuticals."

Dr Brown's interest in matters pharmaceutical arose from his parental background. His father, Stanley Brown, was one of two brothers who ran the pharmacy business transfer agency, Orridge & Co., which had been acquired by his grandfather, William Brown, from the Orridge family. Stanley Brown was not a pharmacist but was keen that his son should be, so that he might become involved in the retail pharmacies purchased in the course of running Orridge's.

A two year apprenticeship was served at Savory & Moore's in Bond Street between 1954 and 1956, and then he graduated from the University of London's,School of Pharmacy in 1959. However, in the event, after a year as a middle school schoolmaster at Guildford Grammar School he went to Cambridge for three years and obtained a Ph.D. in organic chemistry.

During the six years at university Philip Brown had shown an interest in journalism, starting a weekly student newsletter at the Square, called *Sig,* and working as photo editor on the Cambridge University students' newspaper, *Varsity.* After Cambridge he decided he did not want to be a practising pharmacist, a school teacher or an organic chemist, and became instead a medical reporter on the *Daily Express.* There he worked with one of Fleet Street's leading science, medicine and defence reporters, Chapman Pincher.

"I stayed with the *Express* for just over two very hectic and interesting years. My responsibilities covered medicine, science and medical politics. The deadlines were daily and I wrote news articles and features for a circulation of over 4.7 million. Those were the halcyon days of newspaper journalism: it has been downhill ever since."

From the *Express* he moved into the pharmaceutical industry for two and a half years. At first, with Sterling Winthrop he was in the new product development department, then in marketing research where he investigated methods of improving advertising and promotion to the medical profession.

Whilst at Winthrop he became managing editor of the company's two weekly in-company staff newspapers: one written for the U.K. staff, and the other for the staff in the ten European affiliate companies. The experience gained was invaluable when setting up *Scrip*. The international pharmaceutical industry was then in its infancy. Communications between affiliate companies was only at the highest managerial level, and there was a very poor understanding of the workings of the different market places.

From Winthrop in 1969 he went to the J.Walter Thompson advertising agency in Berkeley Square, London, to lead their embryo special group exclusively concerned with pharmaceutical advertising. The unit was called *Deltakos,* and it was headed by an American, Dr Henry J.Barnum,

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nephew of Phineas T.Barnum of circus fame. It was decided to launch a business publication which we named *Scrip World Pharmaceutical News.* The name came from a member of staff, Ken Walker, and was as close as we could get to the abbreviated word for prescription - script. The name could not be registered as it was already used commercially.

In summary, the editorial policy was based on the following criteria. Firstly,the identification of typical readers as being senior executives in the pharmaceutical industry who had international responsibilities, and secondly,the further identification of their particular informational needs. "We decided from the start to take a very objective, unbiased approach, We recognised that we did not want to become a P.R. sheet simply toeing the industry's political line. We decided to avoid expressing opinion...." From the outset it was recognised that staff who were competent in several foreign languages would have to be employed. "We opted to publish in English, however, as this is the common language of the international pharmaceutical industry."

"When we started *Scrip* as a once-weekly news publication, we had no direct competition. In France, a law firm was publishing a monthly synopsis in French of world pharmaceutical news with a bias towards French and American news. In the United States, a company called FDC Publications was producing a number of news publications for the pharmaceutical industry, the best known of which was *The Pink Sheet,*founded in 1939. It dealt almost exclusively with the American market (principally Washington/F.D.A. news) and was read mainly in the USA and by ex-patriate executives working in overseas affiliates. In Japan there was a Japanese-language pharmaceutical industry publication that appeared daily, and in Germany there were German monthly industry magazines, the most important being *Die Pharmazeutische Industrie* which carried some international news. *Scrip* was the first news-publication that aimed to cover the world market for a worldwide readership."

The new venture was staffed under Philip Brown's managership, by an editor, Barbara Obstoj, two journalists, Pamela Seigal and Caroline Davis, and Brown's wife who contributed information from the German speaking countries. After a short time a science editor, Graham Burton, was employed.

"We sold the publication by direct mail, charging just £47.50 for an annual subscription. Today we charge £390 in the U.K., rising to £455 in Australia, the difference being accounted for by the cost of airmail postage for the hundred issues a year. To launch *Scrip* we produced a dummy isue in March 1972 which we posted to 6,000 companies in over sixty countries. The first issue was published on 1 April 1972, and was sent to sixty subscribing companies."

"Looking back to those early editions, I recognise that we clearly thought the pharmaceutical world consisted of two centres - the U.K. and the U.S.A., since most of the news came from them. It took time and effort to build up international information sources and so a parallel international readership."

A fairly aggressive approach was adopted which generated a degree of uncertainty amongst the clientele of the *Deltakos* advertising agency. Looking back one can see that there was a conflict of interest between the editorial objectives of *Scrip* and the confidentiality requirements of the pharmaceutical companies who were clients of *Deltakos.* In particular, Beecham, a major client, was unhappy and eventually demanded the right to pre-publication vetting. This resulted in friction between all parties.

In 1976, JWT decided to end its connections with *Scrip,*and Dr Brown was able to take over the publication as a going concern. The publication was purchased for a modest sum by PJB Publications Ltd., a company established by him and his wife 50:50. After a short time Miss Obstoj left to work in another pharmaceutical area and the editorship was taken over by Brown for ten years. From 1977 to 1987 the circulation rose from 1,400 to over 4,500, and since the arrival of the third editor, Miss Moira Dower, has risen to just under 9,000.

PJB Publications now have six publications, a reports service, and the online databases, and employ 160 people."We have also recognised the need for a physical presence in the U.S.A., and accordingly have a three-person editorial staff based in New York, along with a five-person administrative staff. In Tokyo we have a man on the ground who enjoys Japan, probably also because he is married to a Japanese."

In the matter of the developmemnt of *Scrip* as a business, initially,the revenue came directly from subscriptions but quite soon advertising from outside organisations was accepted. Reader service documents on offer were also advertised. This service matured into the *Scrip* Bookshop service selling today around 6,000 reports a year costing on average about £250 each. The next source of revenue came with the development of *Scrip* into an electronic news service.

"In closing I would stress two key lessons we have learned: first, that at all times it is the quality of the information that counts. Whatever the media by which it is transmitted, the essential thing is to provide accurate, truthful information; second, that if markets are to work efficiently they must be transparent. The more information there is, the better will the markets work."

Abstract of a talk given by Dr Philip Brown on 10 November 1993 at Lambeth to BSHP and the Royal Pharmaceutical Society of Great Britain.

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THE DUTCH PHARMACIST IN THE MID-NINETEENTH CENTURY.

Dr. A.I.Bierman.

Introduction.

This article, based on the paper "Pharmacy in the Netherlands in the 1840s" given at the Spring Conference of 1991 at Greenwich, (theme: Pharmacy in the 1840s), is a first attempt to contrast and compare the development of pharmacy in Britain with that in the Netherlands. Such a comparison is of interest because there are so many differences between the two countries.[1]

Maybe the most substantial difference is the fact that, contrary to his British colleague, the Dutch pharmacist has never been allowed to practise any branch of medicine. This, of course, does not mean that he never did so. There is no doubt that pharmacists broke the law many times judging by the considerable number of complaints by physicians and surgeons, but by law they had only the qualification to prepare and deliver medicines on prescription. They could also sell medicines without prescription but were not allowed to add any medical advice to these "over the counter" sales.

Under these conditions it is understandable why in the Low Countries we find pharmacists almost exclusively in urban areas. From the 17th. century onwards in most big towns pharmacists were united in guilds. The guilds had their own laws for practise, but they were supervised by the local civil authorities and also usually by the doctors. The guilds played as well an important role in education and training which were in the hands of the established pharmacists. Teaching therefore took place according to the master-apprentice model. This situation remained almost unaltered till the end of the 18th. century when sweeping changes made their appearance.

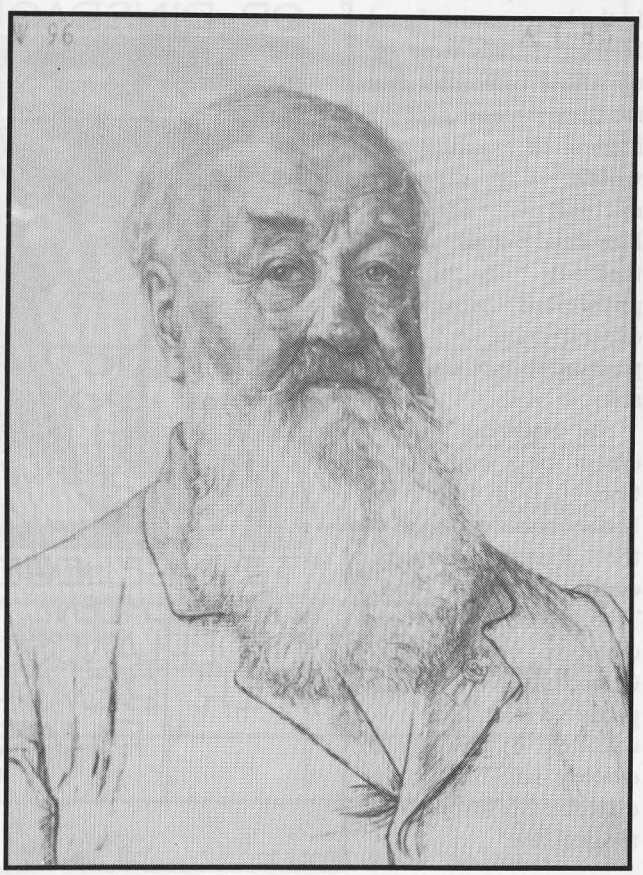
The "velvet revolution" and after.

The French Revolution which started in 1789 strongly influenced the political events in the countries nearby. In the Netherlands, the French ideas of "freedom, equality and brotherhood" were most warmly welcomed. As a result the Dutch rose in revolt against their "Stadholder", William V, who escaped to England in 1795 in the night of January 18th.[2] On the next day the "Batavian Republic" was proclaimed. In contrast to the bloody events in France, the Dutch revolution passed off so quietly that historians have called it "velvet".

The new Batavian Government abolished the guilds almost immediately. These corporations were indeed contradictory to the new ideas, in particular with the principle of equality. Making new regulations however proved to be an enormous task. The Batavian government held the conviction that government was responsible for the health of its citizens. Parliament indeed constitutionised this principle at the very start of the Batavian Republic, and then tried to formulate a single bill which would apply to the supervision of all medical and related professions. They were successful: in 1804 a new Medical Regulation took effect.

The Medical Ordinances of 1804.

The 1804 Act distinguished between two kinds of medical practitioners. There was the "doctor medicinae", graduated from a university, who was licensed to practise all branches of medicine, including internal medicine and pharmacy,and on the other side were the so-called medical sub-professions of surgery, obstetrics and pharmacy, for which no university



J.E. de Vrij aged 83

requirements were needed. So pharmacy had become a medical sub-profession, but pharmacists were still not qualified for any medical practice.

In several ways the 1804 Act may be called unique. Local regulations, till then different in each town, were replaced, in theory, rights and duties were the same now for every medical practitioner in the country. However, the discussions in Parliament had already made it clear that two centuries of federalism were not easy to remove -

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and the 1804 Act still contained quite a number of federalistic elements.

According to this Act, a Provincial Medical Board was installed in every province (or district) of the Batavian Republic. These Boards had a threefold task. They had to exercise the supervision of the professional activities of all medical practitioners in rural areas, they had to examine all apprentices in the medical sub-professions, and had to take care of public health. In the larger towns, Local Medical Boards were set up whose committee had the same duties except the holding of examinations, which was reserved exclusively for the Provincial Boards. On the medical boards, physicians, surgeons, obstetricians and pharmacists each had their seat.

The Batavian system, except for a short period from 1811-1814 when the Netherlands were a part of the French Empire, continued up to 1865.[3] The rather frequent changes to the Constitution that took place in the first two decades of the 19th. century had hardly any effect on this first national medical law.[4]

The Dutch pharmacist in 1840.

How about the Dutch pharmacist in 1840? As we have seen above, our man had to have passed an examination by the Provincial Medical Board, he most likely practised in a town and was supervised by a Local Medical Board of which he may even have been a member. To anyone who takes a look at the various pharmaceutical journals of this period, it will soon become clear that our 1840 pharmacist was not a very satisfied man.

In his dissatisfaction with his working conditions three themes can be distinguished: pharmacists were not taken seriously in scientific matters, their training and education were badly organised by the government, and there were far too many pharmacies.

In the matter of scientific recognition, we should keep in mind that the effect of the rise in natural sciences (particularly that of chemistry) on the development of the pharmaceutical profession had been enormous. Dutch pharmacists had shown great interest in these developments. Various foreign chemistry text-books had been translated and a few pharmacists even published their own work in the field of chemistry.[5] Nevertheless, although a considerable number of pharmacists contributed to scientific matters, it was obvious that in their professional life they were not recognised as professional men.

The current pharmacopoeia in 1840, for example, had been first published in 1823. This *Pharmacopoea Belgica* was in fact a copy of its predecessor, the *Pharmacopoea Batava* published in 1805. By 1823 a number of alkaloids had already been isolated, but their preparation was not included in the *Pharmacopoeia.* Judging from the preface however, the committee responsible for its compilation was aware that pharmacists were able to prepare these drugs. Another serious grief of the pharmacists was that their professional group held no seat on the pharmacopoeial committee as the compilation was entrusted to physicians.

As for education and training the 1804 Act contained no regulations. The Batavian government had not taken over the suggestions for training courses, deeming the costs to be prohibitive. By the second decade of the century

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however it was realised that the lack of training facilities was having serious consequences. In the discussions concerning the 1804 Act, Parliament had expressed its serious concern about public health and the low standard of medical services, especially in rural areas. The 1804 Act should have made changes for the better but failed on this point, the mere obligation to pass an examination proving to be an insufficient measure. Moreover, there were great differences in the examination standards of the various provincial committees. So it happened that candidates moved to a province with a well-known "easy" Medical Board to do their examination, and then returned to their own small town to practise.

In 1823 a new attempt was made to improve this situation. In this year the government decided that "Clinical Schools" should be established in all main cities, and that no apprentice in a medical sub-profession could be admitted for examination unless he had attended for two years the lectures of such a school. In theory this should have made a significant contribution to pharmaceutical education as pharmacists-to-be, being apprentices in a medical sub-profession, were obliged to attend the lectures. However in actual fact, the new schools were set up for the education and training of rural medical practitioners, and as already explained, the Dutch pharmacist is not one of this company. In the educational programme of the schools, pharmacy had a minor position.

The government, moreover, did not provide any money for the project which was probably the main reason why the operation was only partly successful. Clinical Schools were established in only six cities, all of them in the western part of the Netherlands, so that the problem of proper pharmaceutical education and training was not settled.[6] The pharmacists certainly had a need for education in this period of rapid development in the natural sciences, the master-apprentice model taken over from the guilds did not fit well into these circumstances.

The profession itself now took action. In eight cities, nation-wide, established pharmacists managed to set up training courses.(See Fig.1) In some places accomodation was found in an existing institution such as a university, in others, private education was started by established pharmacists using any means at their disposal.[7]

The third problem,that of most towns having a number of pharmacies out of all proportion to the number of inhabitants was difficult to solve. In the northern part of the province of Holland,for example,the average clientele of a pharmacy numbered about 800 persons. (See Table 1.) And even worse these people were not dependent on the pharmacy shop for buying their "over the counter" medicines as these could be purchased from the druggist.[8] As an understandable consequence, pharmacists often resorted to malpractice for their economic survival which became yet another handicap in their struggle for their recognition as scientific men of high moral standing.

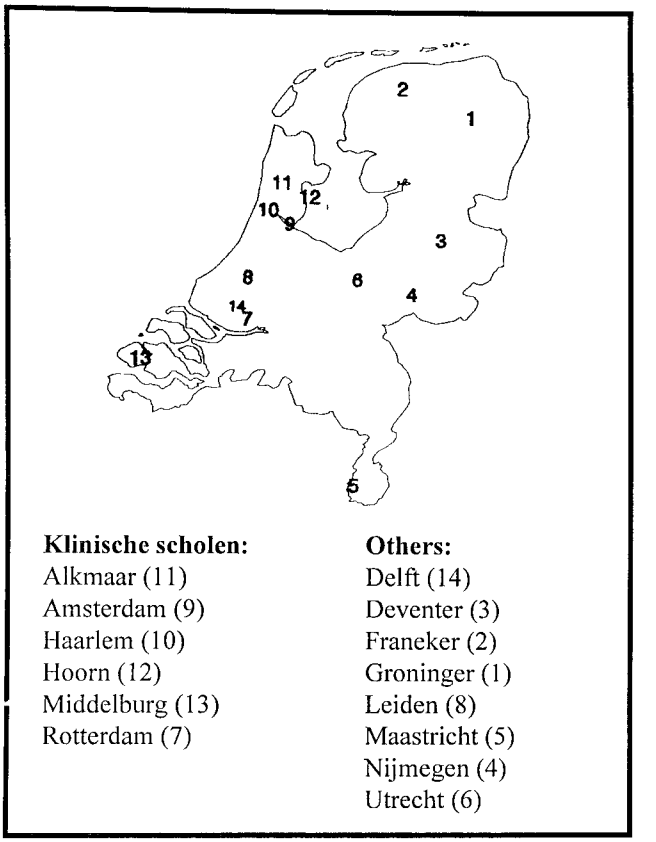

Fig. 1. Places with a Clinical School or other training course for apprentices.

Town	Number of pharmacies	Population	People per pharmach
Alkamaar	10	8435	c. 800
Amsterdam	150	191460	c. 1200
Enkhuizen	5	5108	c. 1000
Hoorn	11	8155	c. 750

Table 1. Relationship of people to pharmacies c. 1825

Other movements in the 1840s.

In the Netherlands, traditionalism and self-satisfaction had their heyday during the first half of the 19th. century. In the 1840s a careful revision started which was closely linked to the appearance of "liberalism", in its turn linked with the phenomenon called the "Industrial Revolution."[9] The new liberal ideas were carried out by economists and business as well as physicians. The latter were concerned about public health and especially the care of the poor. A

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Statue of J.P. Minckleers in Maaastricht

progressive group of physicians was convinced of the connection between the appearance of cholera and the living conditions in houses, slums and factories. Cholera had hit the Netherlands for the first time in 1832 and the medical profession was powerless in the battle against this recurrent disease. The Medical Boards simply had neither the power nor the authority to force the local government to take the necessary measures against poor sanitary conditions. Therefore, in the 1840s many voices were raised in favour of a new Medical Act.

The physicians asked for better public health care and pointed to the much better conditions abroad, especially in Britain and France. They believed that a new source of medical progress was to be found in science and consequently that the current situation should be abolished. Pharmaceutical voices too came into the discussion.

The pharmacists' arguments in favour of a new Medical Act were however quite different, public health and medical progress were not their main concern. Pharmaceutical progress had already been made and was still continuing, what pharmacists wanted most of all was independence. They believed that pharmacy should become an independent profession without any medical bonds, and that the pharmacist should be recognised as a scientific man who, thanks to his professional knowledge, was able to prepare correctly all types of medicine.

The foundation of a national pharmaceutical society.

Unfortunately, at first, the pharmacists' voices were almost ignored. In 1841 a committee was set up to make proposals for revising medical legislation, but on this committee pharmacists held no seats. It was due to this omission that on 23 April 1842 the Dutch pharmaceutical society, the "Nederlansche Maatschappij ter bevordering der Pharmacie" (N.M.P.) was founded. The founders were sure that a national society of pharmacists could be a great help in the pursuit of independence. And indeed results followed.

Almost immediately a pharmacist was appointed to the new legislative committee. Also in 1842 a new pharmacopoeial committee was set up and for the first time in history a pharmacist had a seat on it. This pharmacist was Anthony Johannes d'Ailly (1793-1851) of Amsterdam. (See note 5) There was however still a long way to go. The publication of the new pharmacopoeia did not take place until 1851, and another 23 years had to pass before medical law was again reviewed and changed

In 1865 a new Medical Act took effect. Pharmacy indeed became an independent profession covered by a special

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law, education and training now had to take place at university. The liberal government however did not have any wish to make any regulations with regard to the number of pharmacies.

In spite of the differences in pharmacy practice between Britain and the Netherlands in earlier centuries, it is interesting to draw parallels between them. In both countries in the mid-nineteenth century the pharmacist was dissatisfied with his lot, and both founded national pharmaceutical societies (within a year of each other) with many similar objectives.

Notes and references.

1. A review of the development of pharmacy in Britain was given by Dr J.Burnby at the 1989 Autumn Conference of the Kring voor de geschiedenis van de pharmacie in Benelux. See the *Bulletin Kring voor de geschiednis van pharmacie in Benelux,* 1991, vol.20, pp.6-9.
2. The Dutch Republic of Seven United Provinces (1572-1798) had a "stadtholder" as their leader. In origin this stadtholder had been a governor on behalf of the Spanish king who was also sovereign of the Low Countries. The Republic maintained this office but kept a weather eye open for undesirable elements. Civil power remained in the hands of the ruling class, and it has to be said that the stadtholders showed a strong tendency to sovereign authority. Therefore, after the death of William II in 1650, the ruling class at first decided not to appoint a stadtholder,but in 1672 the Republic was heavily attacked by the French, and the Dutch people, sure that a descendant of the great William the Silent would save them, demanded a stadtholder. William III, the posthumous son of William II, was given the supreme command of the Dutch troops, but also demanded -and received- the stadtholdership as well, which furthermore had to become hereditary within his family. It was a great relief to the Dutch that William (who also became William III of England) died childless.
3. The French Medical Law in force during the French occupation showed great promise for the future of pharmacy, the French Act removing the failings of the Batavian 1804 Act in education and training as it provided for the establishment of pharmaceutical schools. What is more, pharmacists were far more independent of physicians, and the sale of "secret remedies" submitted to questioning.
4. For these changes in Constitution see, S.Schama, *Patriots and Liberators. Revolution in the Netherlands 1780-1813,* New York, A.A.Knopf, 1977.
5. A.J.d'Ailly,(1793-1851) was a well-known pharmacist and manufacturer of quinine sulphate.
   J.P.Minckelers,(1748-1824) of Maastricht was one of the early workers on gas extraction from coal.
   J.E. de Vrij, (1813-1898) one of the founders of scientific pharmacy translated Heinrich Rose's textbook on analytical chemistry in 1835. N.C. de Fremery, professor of chemistry at Utrecht University, and P. van Werkhoven,(1772-1815) pharmacist in that city, translated A.L.Lavoisier's *Traite elementaire de chimie* in 1800. N.C.Meppen, surgeon and pharmacist in Diemen in 1815 performed the same task on J.B. Trommsdorff's important *Sytematisches Handbuch der Pharmacie,* whilst the three Rotterdam pharmacists, A.S.Tischauser, B.Eikma and A.F. van der Vliet were the translators of J.J.Berzelius' famous textbook.
6. In Alkmaar, Amsterdam, Haarlem, Hoorn, Middelburg and Rotterdam.
7. Training courses were started at Delft, Deventer, Franeker, Groningen, Leiden, Maastricht, Nijmegen and Utrecht.
8. In the Netherlands, the title "druggist" is not an alternative for pharmacist, but is an unqualified person who keeps a drug-store.
9. In Britain the Industrial Revolution had started already at the end of the 18th. century, so in this case the German poet, Heinrich Heine, was right when he remarked that in the Netherlands everything happens fifty years later.

THE EARLY YEARS OF BRITISH PHARMACEUTICAL JOURNALISM.

Dr J. Burnby.

The "Prehistoric" Stage.

The first periodical to be published by a pharmacist solely for pharmacists was the Pharmacutical Journal, and that was not seen before July 1841.[1] It is curious that a pharmaceutical journal should be so late in appearing in Britain for pharmaceutical literature of high calibre was by no means lacking. Cowen writing about the remarkable spread and influence enjoyed by British pharmacopoeias concluded that it was due to leadership in pharmaceutical reform, in particular the *London Pharmacopoeias* of 1746 and 1788, and that of Edinburgh in 1756. These publications reflected the new advances in learning with the purging of errors, the addition of new and powerful drugs, and the lucid presentation of chemical procedures.[2]

Other, unofficial, dispensatories were equally well regarded. The 1753 *New Dispensatory* of William Lewis, described as "a regular book of practical and scientific pharmacy", proved enormously popular both at home and abroad throughout the 18th. century.[3] It was up-dated by Andrew Duncan,senior,of Edinburgh in 1786, and again by his son of the same name in 1803 when it became known as the *Edinburgh New Dispensatory.*[4]

At the time of which we are writing, the professions of pharmacy and medicine in Britain were not separated. The majority of doctors, whether termed "apothecary" or "surgeon" were in fact "general practitioners" who practised not only medicine and surgery but pharmacy as well. Consequently, it was usual for articles of pharmaceutical importance to appear in medical journals. Even physicians and "pure" hospital surgeons interested themselves in the newly developing scientific pharmacy.

In the second half of the 18th. century there was a growing concern with the adulteration and contamination of food. Cases of illness and death were reported in the journals, and in 1780 there appeared in *Medical Commentaries* an important paper by William Blizard, an eminent surgeon, on the experiments and observations he had made on the danger of using copper [sic] and bell-metal mortars in pharmaceutical preparations.[5] A few years earlier,Sir George Baker,MD.,FRS.,FCP.,of Devonshire Colic fame, had written in *Medical Transactions* on the hazard of verdigris contamination when using copper utensils.[6]

This trend continued up to and beyond the rise of chemistry as an independent discipline. For many years chemistry was taught in the universities purely as an adjunct to medicine. Pharmacy and chemistry were closely connected, so much so that Robert James could write in the preface of his *Dictionary,* "The Art of Chymistry will only fall under our Consideration as a branch of Pharmacy...."[7] Indeed, the interlinking of pharmacy and chemistry was so close that the British pharmacist was no longer known as an apothecary but as a chemist or a chemist & druggist.[8] Pharmaceutical articles now began to appear in journals with the word "chemist" or "chemistry" in their titles.

William Nicholson's *A Journal of Natural Philosophy, Chemistry and the Arts,* commonly known as *Nicholson's Journal*

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first appeared in 1797 and continued until his death in 1815. Nicholson was a man of many avocations, trader, mathematician, patent agent, inventor, chemist and physicist. An admirer of the French chemist, Antoine Francois Fourcroy (1755-1809) and translator of his works, his articles extracted from *Annales de Chimie* often graced the pages of Nicholson's publication.

Articles such as that of D'Arcet on the manufacture of Prussian Blue, Vogel on Sugar of Lead, Vauquelin on chemical examinations of vegetable substances, or Duportal and Pelletier's experiments with gold employed medicinally, often appeared. Other important ones were those by Benjamin Collins Brodie relating to what was then termed "animal chemistry"; usually his papers had already appeared in the *Philosophical Transactions* of the Royal Society.[10] This innovative journal also published papers by Andrew Duncan,junior, on the isolation of "cinchonin" from Cinchona, and William Thomas Brande's work on Benzoin, and his views on the theory of respiration.[11]

Such "paste and scissors" work was common in most journals at that period. Nicholson printed a paper on the extraction of the saponaceous principle by a Mr Schrader of Berlin which had appeared in *Annales de Chimie,* but was in fact an abridged version of the original in *Gehlen's Journal.* Likewise *Annals of Philosophy* published an article on cafein [sic] by M. Pelletier which had been extracted from the *Journal de Pharmacie,* whilst the *Edinburgh New Philosophical Journal* did not hesitate to use information from the same French journal to clarify a point in their article on Iceland Moss. This Scottish publication carried a considerable amount of material which was of interest to the pharmacist, such as articles on the Cassia bark of commerce, Cinnamon, Boracic Acid lagoons in Tuscany, and the adulteration of fixed oils.[12]

Ignoring the *Chemist,* a weekly journal first produced in 1824 and aimed at students of the newly founded Mechanics Institutes, we come to an important monthly publication, also called the *Chemist* which first appeared in 1840. The life of the first *Chemist* was a mere 13 months, but that of the second was 18 years. The editors were Charles Watt a lecturer in chemistry, and a young relative John Watt junior.

The *Chemist* as the editors pointed out was intended to fill the want "...of a journal expressly devoted to Chemistry, Chemical Manufactures and Pharmacy [which] had long been felt...." Each issue was divided into three sections which dealt with those particular interests.The pages devoted to pharmacy covered not only the scientific aspects but also discussed the need for strict professional examinations, the desirability of shorter hours and exemption from jury duty, the sale of poisons, the organisation of chemists & druggists,and included price lists. The founding of the Pharmaceutical Society of Great Britain in 1841 was given a cautious welcome and much good advice. The Society was warned against the machinations of the medical profession as well as the doctors' ignorance, and the pharmacists were told that they must guard their interests with ceaseless vigilance. By the end of 1842, the *Chemist* was very disillusioned with the Pharmaceutical Society, believing it incapable of improving the practice and status of pharmacy in Britain.

A few well-known pharmacists, such as John Mackay of Edinburgh founder of the Scottish Branch, contributed to its pages but the editors admitted that there was a grave dearth of British contributors in all sections. As the years passed the journal turned more and more to pure chemistry.

A competitor of the *Chemist* appeared on the scene in 1842, a fortnightly publication with the long title of, the *Chemical Gazette or Journal of Practical Chemistry in all its application to Pharmacy, Arts and Manufacture.* Having such a broad field to cover it is not surprising that "pharmacology", as the scientific study of pharmacy was then termed, received but slight attention from the editors, William Francis and Henry Croft, who had studied at Berlin and Giessen. It was openly contemptuous of the infant Pharmaceutical Society. After a life of 17 years it merged with *Chemical News* in 1859.

Of far greater pharmaceutical interest and potential was the *Annals of Chymistry and Practical Pharmacy.* Unfortunately its life was a bare seven months long, appearing first of all fortnightly and then monthly.[13] During its short existence, papers were published on concentrated infusions, Ung. Hydrarg. Nit., Camphor cake for chapped hands, the ever present problem of adulteration, and the costs and losses incurred in grinding ten selected drugs. Tables were drawn up in order to compare five pharmacopoeias, and, a new touch, a gold medal was offered for the best contribution on the preparations to be found in the *Pharmacopoeia Londinensis.*

It may thus be seen that there was no real shortage of scientific pharmaceutical published material, but it appeared sporadically in many journals and so presented problems of accessibility. Furthermore as none of these publications was produced specifically for pharmacists their hopes and aspirations were not discussed. World priority for a periodical to be exclusively orientated towards pharmacy and pharmacists is given to Germany with Trommsdorff's *Journal der Pharmacie* of 1794. Even the youthful United States of America produced in 1825 its *Journal of the Philadelphia College of Pharmacy* which as Jacob Bell noted was becoming increasingly prestigious. Britain had to wait another 16 years before it saw a journal given entirely over to pharmacy.

The *"P.J."* and some others.

Almost immediately after the foundation in April 1841 of the Pharmaceutical Society of Great Britain, the young, energetic, founder-member, Jacob Bell, instituted scientific meetings. To their great disappointment owing to pressure of work or geography many members were unable to attend, so Bell on his own initiative and expense began a monthly journal in order to record these proceedings. The first number appeared in July 1841. After a couple of changes the title became in the January of the following year the *Pharmaceutical Journal and Transactions.*

For 18 years Bell remained editor and proprietor using his journal in every way he could devise to further the work and objectives of the Society. He solicited the assistance of his friends for the supply of scientific articles, and within six months he had more than enough material for each number. As a member of the Society's Council, an honorary member of many foreign scientific societies, a Fellow of the Chemical, Linnean, and Zoological Societies, a supporter of the Royal Institution, and a

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connoisseur of fine arts, he had many excellent contacts. It has also only recently been realised what an important role his friend Dr Jonathan Pereira, a man of European renown, had played in the early years of the Journal.[14] In every editorial Bell cajoled and urged the members of the Society to behave professionally, to believe in the future of pharmacy in Britain.

When only 49, Jacob Bell realising that death was near, proposed that his Pharmaceutical Journal with full copyright should be transferred to the Society, a proposal which was gratefully accepted by Council on 1 June 1859. With characteristic thoroughness he drew up a 16 page document in which he made detailed suggestions as to how the Journal should be run in future. He signed the transference of ownership only hours before he died on June 12th., perhaps the most important gift of many that this talented and hard working man ever gave to British pharmacy.

Of course other rivals appeared in the field, most were short lived. September 1846 saw the appearance of a weekly called the *Pharmaceutical Times* which had the curious sub-title of, *A Journal of Chemistry, applied to the Arts, Agriculture and Manufacture,* with no mention of pharmacy at all! The editor for much of its life was a Dr John Scoffern, LSA.,B.Med. of London University. He was a Professor of Chemistry at Aldersgate College of Medicine where Pereira was also a lecturer, but there seems to have been great animosity between the two men.

The author of a number of books, Scoffern was well known for his work on the manufacture of sugar. In his periodical, he dealt with the usual pharmaceutical problems of long hours and poor pay which he felt the Society did not take seriously enough, with poison sales, the preparation of galenicals, and with education. As with the earlier journals he found difficulty in finding first-rate material, and eventually, like the *Gazette* and the *Chemist,* turned more towards chemistry re-naming the journal the *Chemical Times.*

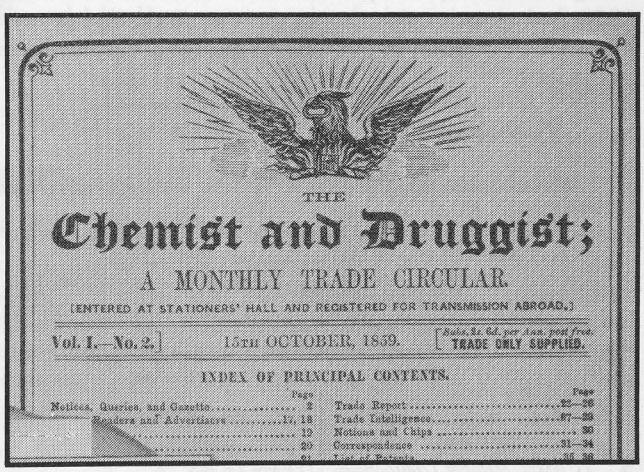
We now come to two journals which had a considerable effect on the internal affairs of the Pharmaceutical Society. *The Chemical Record and Drug Price Current: A journal devoted to Chemistry, Pharmacy and the collateral Sciences,* and *Annals of Pharmacy and Practical Chemistry.* The earlier of the two was the *Record* which appeared as a weekly on Saturday, 19 July 1851, price 5d. The national newspaper, *The Times* of 9 October carried the following advertisement, "To Chymist & Druggists - Dr Pereira's Lectures on Materia Medica delivered at the Pharmaceutical Society...[will] appear every Saturday in the 'Chymical Record'." This publication of his lectures was without Jonathan Pereira's permission and was something to which he strongly objected.

The names of the editors of the *Record* are not disclosed but Pereira identified them in his letters to Jacob Bell as "D.& B.",that is the pharmacists William Dickinson and William Bastick. Both men attended Pereira's lectures, were members of the Pharmaceutical Society and of its Council. They with Walter Hemingway contended that the government of the Society was too exclusive, too much under the influence of Jacob Bell, and that the P.J. was just a vehicle for promoting Bell's own business.

It is apparent that the *Record* was trying to copy the example of the *Lancet,* a vituperative but influential weekly medical journal founded by Cecil Wakly in 1823. In its early days in order to gain prestige, it had published the lectures of the great surgeon Sir Astley Cooper, albeit without his authorisation. Cooper was then at the pinnacle of his fame and for a while voiced no objection, but later insisted that the material must appear anonymously. The *Lancet* then tried the same trick on John Abernethy but he was not so compliant and instituted legal proceedings in which he was at first successful but finally lost his case.[15]

Pereira was determined that his lectures should not be pirated and refused to continue his course unless the Society's Council took steps to protect him. This was brought about by his students individually declaring that they recognised that the copyright lay solely with Pereira. Significantly, Dickinson first of all refused to sign the declaration but then changed his mind and did so, whilst Hemingway and Bastick remained adamant in their refusal. Pereira did not believe that this strategem would succeed but apparently it did, and may have been the reason for the decision of Dickinson and Bastick to start a new journal, the monthly *Annals of Pharmacy,* and to allow the *Chemical Record* to die.

The *Annals* first appeared on 1 January 1852. It had few original scientific papers but was an improvement on the *Record* which, except for the leaders, was made up of reports of lectures and extracts from scientific works, the sources of which, unlike the P.J., were never given. The primary purpose of these *Annals* seems to have been to fight Jacob Bell every step of the way in regard to the Pharmacy Act of 1852 and the subsequent bye-laws. When the editors discovered that their efforts were unavailing they closed down the *Annals* after only three years of acrimonious life.


THE
Chemist and Druggist;
A MONTHLY TRADE CIRCULAR.
(ENTERED AT STATIONERS' HALL AND REGISTERED FOR TRANSMISSION ABROAD.)
Vol. I.—No. 2.] 15TH OCTOBER, 1859. [Stamped 5d. per Ann. post free. TRADE ONLY SUPPLIED.
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Finally mention must be made of one journal which has had an eminently successful career, the still extant *Chemist & Druggist.* William Vaughan Morgan, one of six brothers who were wholesale chemists, sundriesmen and hardware factors in the City of London, started in May 1859 a monthly journal, the *Ironmonger,* claimed to be the first ever trade paper as the term is now understood. It was an immediate success, whereupon brother Septimus decided to bring out a similar journal for

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chemists & druggists in September. Originally it consisted of 64 pages, 16 of which were devoted to pharmaceutical information concerning new patents, lines and processes, and business developments, the remainder were used for advertisements.[16] It was as successful as the *Ironmonger* and in 1886 became a weekly publication.

The reasons for success or failure should be briefly considered. Possibly the greates problem of all these early journals was the lack of British scientically based pharmaceutical material which meant a heavy dependence on Continental articles with the expenses of perhaps none too reliable translation. None of the other editors had the wide circle of contacts possessed by Jacob Bell and Jonathan Pereira which placed them at a considerable advantage.

As Bell said over and over again, the British pharmacist had to have repeatedly demonstrated to him the value of chemistry and pharmacology to pharmacy. It was hard work and at times perhaps he felt close to despair. Certainly the *P.J.* was no profit making venture. At the time of the transfer, Bell wrote that he had performed the office of editor without any salary and yet usually made a loss varying from £20 to £60 a year. This was something that Dickinson and Bastick, although the former was a man of means, were not prepared to do, despite their avowed desire to advance pharmaceutical science. In their last number, they wrote that a journal devoted to science, "...and unsupported by exclusive privilege", which they falsely claimed was the case of the *Pharmaceutical Journal,* would not make a profit.

The reasons for the success of the *Chemist & Druggist* were two- fold. Firstly, it served a different function from the other journals in as much that it was frankly launched as a trade magazine, although the literary section was destined to be much enlarged. Secondly, the pharmaceutical climate in Britain in 1859 had greatly changed since the founding of the Pharmaceutical Society in 1841 and the passage of the Pharmacy Act of 1852.

Notes and References.

1. Initially the journal was called the *Transactions of the Pharmaceutical Meetings.*
2. D.L.Cowen, *The Spread and Influence of British pharmacopoeial and related Literature,* Stuttgart, Internat. Soc. Hist. Pharm.,1974.
3. The work of William Lewis (1708-1781),MB.,FRS.,was an improved and modernised version of John Quincy's *A Compleat English Dispensatory* of which there were ten editions between 1718 and 1736.
4. Andrew Duncan the elder (1744-1826) MD.,(St. And.) and Andrew Duncan the younger (1773-1832) MD.,(Edin.) were both professors of the institutes of medicine at Edinburgh University.
5. W.Blizard, *Medical Commentaries,* 1780,vol.7,p.313. William Blizard, Kt.(1743-1835) FRS., was surgeon to the London Hospital.
6. G. Baker, *Medical Transactions,* 1772, vol.2,p.265.
7. R.James, *Dictionary,* London,vol.1,1743, vols. 2 & 3, 1745.
8. The use of the terms "pharmacy" and "pharmacist" are comparitively recent in Britain, the retail or community pharmacy is still most commonly called by the lay public "the chemist's".
9. *Nicholson's Journal,*1812, vol.33,pp.263-70,274-892,143-8, 179-85
10. Ibid., vol.33,pp.258-63; vol.30, pp.295,324. Benjamin Collins Brodie, Kt.(1783-1862) FRS.,became president of the Royal College of Surgeons.
11. Ibid., Dec.1803, vol.6,p.23; vol.10, Feb.1805, p.82; vol.11, 1805, p.79.
12. The *Edinburgh New Philosophical Journal,* 1839-1840,vol.28, pp. 20,27,85,250.
13. From October 1842 to April 1843.
14. J.G.L.Burnby,C.P.Cloughly,M.P.Earles,(editors), *My Dear Mr.Bell: Letters from Dr Jonathan Pereira to Mr Jacob Bell,1844 to 1853,* Madison and London, AIHP and BSHP, 1987, p.10.
15. The *Lancet,* centenary supplement, 6 Oct.1923, pp.691-693.
16. "Our First Hundred Years",*Chem.Drugg.*,10 Nov.1959,pp.110-12.

The above paper is based on one that was given to the International Society for the History of Pharmacy held in Athens in 1989, and a second to an international colloqium in Paris,1990, on "The World Pharmaceutical Press from its Birth to 1840."

MORE FROM THE HISTORY COMMITTEE

Newsletter No.5 (October 1959) gives details of two letters received by a founder of the Pharmaceutical Society and early member of Council, William Bankes Hudson of 27 Haymarket, London, W.1. He died 13 November 1844, aged 71.

"Taplow, May 16, 1831."

"Dear Sir,

Let me beg you to put up for me in one little parcel a pint of strong Spirits of wine (to be mixed pro re nata with Campher) and one or two ounces of Campher. It is late at night when I write and I cannot inquire and I forget the size of an ounce. Would you be so good as to send as much as would be held in solution by a pint of Spirits when made very strong. I should like to have the Spirits of wine in a strong flat bottle it packs so much better. I will thank you to send the parcel directed to me at Mr. Hatchards, 187 Piccadilly.

I am, Dear Sir,
Your Most Obedient Servant,
W. Wilberforce."

The writer was William Wilberforce (1759-1833) the philanthropist famed for his leadership of the slave abolitionist movement. Mr Hatchard was the well known bookseller in Piccadilly which business he founded in 1797.

The second missive is somewhat briefer:

"Lady Milton requests Mr. Hudson will send her per Coach, two Pint Bottles of the Concentrated Syrup of Sarsaparilla.

Wentworth near Rotherham,
26th August, 1828."

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Contents.

Diary Dates.

Wednesday, 9 November 1994.

"The Foxglove Saga" by Dr J. Aronson.

Society Members' Activities.

We are happy to report that Mr Leslie Matthews, FRPharmS has been elected an Honorary Fellow of the History of Medicine section of the Royal Society of Medicine. As we all know it is a well deserved honour.

The annual Conference, this year held at Nottingham, was undoubtedly a happy conference, made all the better by two of our Dutch members, Dr A. Bierman and Dr. A. Wittop Koning flying in from The Netherlands. This was not all either, they brought with them the membership of two more Dutch pharmacists, Dr Boersma and Dr van Gelder. Those of us who attended the Kring's meeting at Amersfoort will remember visiting the home of Dr and Mrs van Gelder where we saw their magnificent collection of manuscripts, early herbals, ceramics - and flourishing plants. We came away positively green with envy.

Obituary.

It is with sadness that we have to write of the sudden death of Rudolph Drey. His knowledge of drug jars was unparalleled and the loss will be keenly felt. His book *Apothecary Jars* (1976) is the standard work on the subject and will be consulted by all with an interest in ceramics, not least because of its fine glossary pertaining to drug jar inscriptions. BSHP members who attended the Greenwich Conference will remember the visit to his home at Blackheath where we viewed not only objects of pharmaceutical interest but those of archaeology as well. He and Mrs Drey were people of wide interests and great kindness.

Iodine and Pharmaceutical History

A.F.P. Morson.

Across the corner of Bloomsbury Square from the original premises of the Pharmaceutical Society was a house in the row facing the statue of Charles James Fox which was occupied in the 1840s by Andrew Ure. Ure practised as a chemical consultant and analyst and wrote the *Dictionary of Arts, Manufactures and Mines,* a chemical textbook much used at that time. His importance in this story lies in his discovery of the use of manganese dioxide in liberating iodine from the liquors remaining after the extraction of the carbonate and sulphate of sodium and potassium from kelp. His was the first manufacture of iodine in Britain at Glasgow in 1817.

The interest for pharmacists lies in the use of iodine in medicine and photography. It was the pharmacist son of one of the Society's founder members who dominated the

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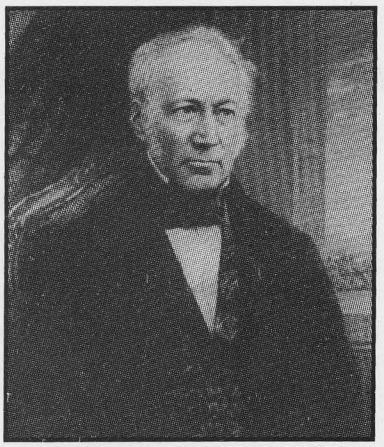
seaweed industry from 1863 until his death in 1899.Edward C C Stanford had great skill both in developing extraction processes of iodine from kelp and in their commercial exploitation. About twenty firms had entered the kelp business by 1845, production increasing steadily as demand grew for pharmaceutical and photographic applications. In 1849 world-wide consumption of iodine had reached 31 tonnes, and by 1960 it was over 2,000 tonnes. Two Scottish and two Irish firms exhibited at the 1851 Exhibition, as did Cournerie of Cherbourg then the "most esteemed on the continent". One of the Scottish firms is believed to have produced in 1850 nearly eight tonnes, one third of all U.K. production.



Andrew Ure

The favoured technique of purification was re-sublimation. Michael Faraday investigated the conditions necessary in the 1820s but abandoned his work when he learnt that several commercial firms, including that of his friend T.N.R.Morson, were in routine production.

The treatment for goitre most commonly used until the early nineteenth century was called the Coventry remedy. In the mid eighteenth century the recipe was the secret of a Dr Bate and it was not revealed until 1779 that an important ingredient was burnt sea sponge.

William Proust claimed that he had used potassium iodide in 1816 for goitres, and certainly three years later St. Thomas's Hospital was using it for this purpose, as was Coindet in Geneva. The physician at Thomas's was Dr John Elliotson who in 1834 was the first president of the Royal Medical and Chirurgical Society, forerunner of the Royal Society of Medicine.

Between 1820 and 1840, many essays were published justifying the use of iodine for every condition from arthritis to ulcers. It was formulated into pills, suppositories, sweets and inhalers, as well as medicated matches and cigarettes, snuff and powders, even contraceptives and an abortifacient. In one French hospital, gauze steeped in iodoform was hung up on the cross-beams of the wards like old-fashioned flypapers in the belief that the vapour was beneficial. Some took to hanging vials of the tincture round their necks like charms.

The earliest specific reference to the tincture being used in wound treatment was in 1839 by John Davies, surgeon to the General Infirmary at Hertford. The American Civil War saw the first use of it for war wounds. At the Battle of Sharpsburg, Colonel Gordon was wounded in his right leg and thigh; soon afterwards his left arm was hit and then his shoulder. No bones were broken but when his face was "struck by a ball", he was taken to a base hospital where Dr Weatherley of the 6th. Alabama Regiment prescribed Tincture of Iodine to be painted on his wounds three times a day. Gordon's wife nursed him, and obviously she believed that if the tincture did good then the more she used the better. She painted the wounds almost continuously. Her attention was rewarded, infection disappeared and the wounds healed; Gordon survived to become a general and a governor of Georgia.

In every war until 1918 iodine and iodoform were included in all ambulance and hospital stores. The standard issue field dressing included a quantity of iodoform, the consumption of which reached a few tons. However, chemical antiseptics proved of little use for the wounds of the Great War. The reasons were discovered by two famous men at St. Mary's Hospital, London, Sir Almroth Wright and Sir Alexander Fleming. Iodine was withdrawn from all official procedures as a result, though it remained popular as a first aid for cuts and for sterilising catgut.

Sources : *Journal of the Society of Chemical Industry.*
: *London Repository.*
: *Ure's Dictionary.*
: *The 1851 Exhibition Catalogue.*
: *Proceedings of the Royal Society of Medicine.*

Mr Humphrey's Inhaler.

W.A. Jackson.

The first half of the nineteenth century saw great advances in technology, and a plethora of medical and surgical inventions were conceived by physicians, surgeons, instrument-makers and even laymen. Many of these were successful and were used for a considerable time, for example Gibson's Physic Spoon,[1] John Read's Enema Syringe [2] and Baunscheidt's Lebenswecker[3]; but many others had a short life, indeed it is doubtful if some were made at all. I believe that Mr Humphrey's Inhaler belongs to the latter group, but it is of interest as the first example of a pressurised inhaler which I have found, and the only one I know which was designed to supply steam under pressure.

It was the invention of an American, Joshua Humphrey of Pons Reading Farm, who described it in a letter dated January

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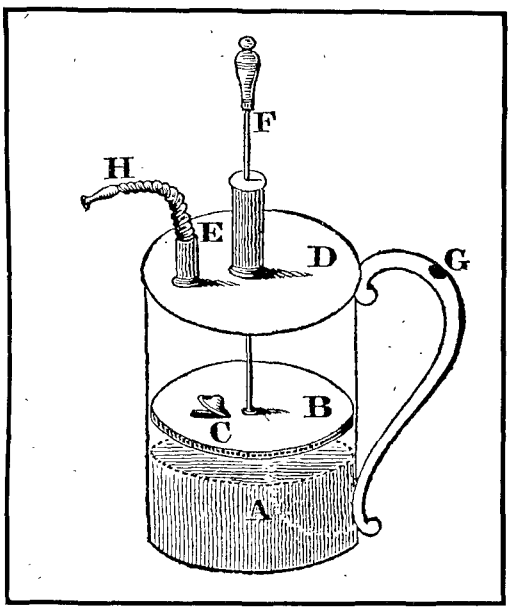
18, 1819 to a Dr C.T.James. This letter was published in *The Eclectic Repertory and Analytical Revue,* and it is from this journal that the accompanying illustration was taken.[4] Mr Humphrey was concerned that anybody in a weak state of health could not inhale sufficient steam from the type of inhaler commonly in use at the time, "without being too much exhausted". Presumably these inhalers were of the type invented by John Mudge circa 1778, the appearance of which closely resembled that of Humphrey's.[5]



Humphrey's Inhaler.

This consisted of a cylinder with a screw top and a hollow handle, the top being pierced to accomodate a mouthpiece H with a valve E and a piston rod F, the end of the piston being fitted with a valve C. The base of the cylinder A contained hot water, and when the piston was driven down, valve E closed and steam was forced through valve C into the upper part of the apparatus. On the upstroke valve E opened, the steam was forced through the mouthpiece, air entering the handle at aperture G and bubbling through the hot water to produce more steam ready for the next downstroke.

I can find no evidence of Humphrey's Inhaler ever naving been made. This is not really surprising as a patient would have to be feeble indeed to be exhausted by drawing in steam from an inhaler. However, one sentence of the letter illustrates a tendency which was steadily growing among the more enlightened gentlemen of the period. He writes, "If it should be found to answer a good purpose, I shall feel myself gratified in having contributed a mite that may in any wise be useful to my fellow creatures." Men such as Joshua Humphreys, who showed concern for their fellows were largely responsible for the increasing recognition of the current social and medical problems which resulted in important nineteenth century reforms.

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History of Pharmacy Committee Notes.

The History of Pharmaceutical Associations.

In January 1956 the Nottingham and District Branch was addressed by the secretary, Mr K.Brooke, on the history of the Nottingham and Nottinghamshire Chemists and Druggists' Association, founded in 1868. The history of these Associations is one of great interest as their minute books reflect the development of pharmacy both nationally and locally.

The first Association was formed in Aberdeen in 1839, two years before the formation of the Pharmaceutical Society. A commemorative booklet was published in 1939 summarising its history. A similar centenary publication was brought out in 1949 by the Liverpool Chemists' Association. The earliest Pharmaceutical Association in England was formed in Colchester in 1841, and at the request of the Committee its present secretary, Mr W.H.A.C.Whyte, prepared for publication its history. A short account is given below, and a fuller one is to be found in the *Pharmaceutical Journal* of 20 October 1956, page 328.

The Colchester Association of Chemists & Druggists was founded in July 1841, the original meeting place being the Three Cups Hotel in High Street. Those present were Mr S.Smith in the chair, and Messrs Meadowcroft, Harrington, R. Smith, Payne, Hitchcock, Edwards, Manthorp and Leech. As well as the general business of the Association, a library of scientific works was formed. Strict rules regarding the length of time a member could keep a book, together with fines for over-running this period or lending the book to a non-member, were part of the original constitution and rules of the Association. The early minutes dealt largely with the purchase of books for

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the library. They were bought from a Mr Churchill, though later a Mr Gladding of Mile End Road offered to supply them at 17½% off the published price. The chemists loyally decided to continue with Mr Churchill.

In August 1841 a special meeting was held, with Mr Manthorp in the chair, to consider a note from Jacob Bell requesting that subscriptions to the British Pharmaceutical Society [sic] be sent and the names of such Colchester druggists as intended to join it be enrolled immediately.[1] The minute book records, "This meeting considers that the only organization which will give authority, permanency and effect to the British Society will be the obtaining of a charter; as this has not yet taken place and appears not to be seriously contemplated, they do not consider that Society 'permanently organised', and consequently it is not expedient to pledge the members of the Colchester Association to pay their subscription to that body." Presumably, somebody relented later for in July 1842 we find a minute thanking Mr Bell for copies of the *Pharmaceutical Journal* and a promise to continue them *gratis* to the Colchester Society.

In 1847 a resolution was passed to inform the public that, "The Colchester Chemists have determined on and after the 26th. day of July to close their establishments at 9 o'clock every evening (excepting on Market Day), after which hour, and on Sundays, no business will be attended to but in cases of necessity". All the members signed the minute book after this momentous decision.

By 1893 the interest in the library was waning and it was finally decided in 1894 to hand over all suitable books to the Public Library Committee. From 1894 to 1909 there seems to have been a break and then the Association was reformed under the title of the Colchester Association of Pharmacists. In 1911 discussion centred on the National Insurance Bill. The following year Boots' branch manager was invited for the first time to the meetings.

In 1915 it was decided to close at the early hour of 7.30 p.m. on Mondays, Tuesdays and Wednesdays, 1 p.m. on Thursday, 8 p.m. on Fridays and 9 p.m. on Saturdays. By 1920 the closing time had contracted to 7 p.m., but a rota was formed, each chemist taking his turn until 8 p.m.

Members in 1921 protested against the new Dangerous Drugs Act, "as it would prevent the retail sale of Laudanum, Morphia, Cocaine etc." A quarrel arose in 1938 regarding opening hours. It would seem that some had been breaking the agreement and the secretary W.H.Whyte was instructed to obtain a Compulsory Closing Order from the Town Clerk. The same year the position of chemists regarding Air Raid Precautions [A.R.P.] was discussed, and in July 1940 they had to consider who was to leave and who was to remain on duty in the town in the event of compulsory evacuation due to a German invasion. By 1943 the general closing time had dropped to 6 p.m. with a 7 p.m. rota. This led to talk about the possibility of members buying a pharmacy in the town which would be run between them.

The immediate post-war years were taken up with discussing the new National Health Service. A liaison committee was set up consisting of three doctors, three dentists and three pharmacists but unfortunately it soon collapsed.

At the time of writing (1956) the Association was still in being and was quite separate from the Society and N.P.U. branches.

1. Samuel Manthorp, sometime chairman and librarian, was an original founder member of the Association. He started in business at 105, High Street in 1834; it was continued by Arthur Weddell, variously chairman and secretary from 1892 to 1926, and is still conducted in the original premises, (built in 1650) by W.H.A.C. Whyte who has been secretary since 1938.

The Lancaster Association has nothing like the long history of Colchester but, as will be seen, it is interesting to make comparisons. A fuller history by Andrew Medcalfe will be found in the *Chemist & Druggist* of 22 August 1964, pages 177-178.

On 30 April 1877 James Vince of 37, Cheapside, Lancaster, wrote to the local secretary, Mr Bagnall, asking him to convene a meeting of local chemists. They met on 8 May at the Assembly Rooms where after discussions concerning the supply of drugs to the Infirmary, it was decided to meet at regular monthly intervals. During that autumn they agreed on a scale of dispensing prices, that they should close at 7 p.m. on weekdays and 8 p.m. on Saturdays, and that prizes should be awarded to apprentices attending the Lancaster Science School.

Thereafter enthusiasm seems to have waned for there is a gap of eleven years in the minutes. Then in October 1878 they met to settle a dispute about the prizes, and the next month tried to decide what they could do about grocers who cut the price of "patent" medicines. There were many ideas but nothing actually done. The price-cutting war undoubtedly had its effect because just a year later the chemists agreed that the prices of all "patent" medicines should be reduced substantially.

That matter having been unsatisfactorily solved nothing more is heard until June 1892 when the question of stamped medicines containing poisons were the centre of discussion. Collis Browne's, Fowle's, and Teasdale's Chlorodyne, and Winslow's, and Fellow's Syrups were all mentioned; it was decided they should be sold at 1s. and 2s.6d. each. They also considered reporting to the Pharmaceutical Society cases where poisons were being sold by unregistered persons. A new set of Association rules was adopted in November, the list of dispensing charges revised and a new price list for poisonous drugs and chemicals drawn up.

The first reference to a social activity, a supper, does not occur until 1893. Two years later the members combined together to publish advertisements of prices in all three of the local papers. The 1898 meeting makes the first

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reference to "multiple" pharmacy in a resolution that nothing should be supplied by the members of Messrs. Boots. The 1900 meetings all dealt with attempts to amend the Companies Act.

All was quiet for a further seven years, then on 3 December 1907 it was decided to revive the Association. For the first time, on 3 March 1908, the Proprietary Articles Trade Association was mentioned, and Mr Bate was appointed the local P.A.T.A. secretary. The implications of the Poisons & Pharmacy Bill were debated at length at a Special General Meeting on 14 April. There were 25 chemists in business in Lancaster and district (which included Morecambe, Garstang and Carnforth) at that date. The meetings of 1908 and 1909 all dealt with the Pharmacy Act and the P.A.T.A., and Sir Norval Helme, M.P. received many letters and several deputations. There was a good deal of acrimonious correspondence regarding the granting of licences for the sale of poisons to unqualified traders, such as seedsmen, and the Pharmaceutical Society came in for much bitter criticism in respect of the Pharmacy Act.

In 1909 a letter was received from the retail prices department of Messrs. Boots suggesting the P.A.T.A. local secretary should try to arrange for an increase of prices locally, and if successful Boots would join in. At the final meeting of that year Mr Gorst talked of the advantages of co-operative buying of "patent" medicines, suggesting that each shop should buy certain lines in bulk and divide the parcel with others.

A Special General Meeting on 21 February 1911 discussed the new examination regulations.[1] Mr Parker felt the expenses that were now incurred would never give an adequate return - a working tradesman could do as well. Many meetings in 1911 were concerned with the National Insurance Bill for which there was little enthusiasm; 1912 was entirely taken up with forthcoming N.H.I. matters. Nine chemists in Lancaster agreed to provide dispensing services, and seven in the surrounding district, but five refused to do so. As early as the beginning of 1913 the "mile limit" was causing trouble. Group buying was again talked about but nothing seems to have eventuated. The meetings were devoted to the N.H.I., closing hours, fees for urgent scrips, increasing dispensing fees, and the use of distilled water in mixtures etc.

October 1913 saw the death of Mr Allbright, aged 97 and Lancaster's oldest inhabitant. He had been born in St. Leonardgate in 1816, was educated at Aldcliffe Lane and Brock Street schools, then went away to Ackworth School, near Pontefract. He was apprenticed at Stockport and returned to Lancaster to open a pharmacy in 1848; his was said to be the first pharmacy to sell paraffin oil for lighting. He remembered when Lancaster was a town of some 7,000 inhabitants, when stage coaches and pack ponies filled the streets, and the cost of a letter from London was 11d., as well as the establishing of the oilcloth industry by Williamsons and Storeys.

The Annual General Meeting of 1914 heard of the proposal for the registration of asssistants without favour. Other matters occupied their minds such as the strong possibility of payments from the Drug Fund being discounted, though most agreed to take on N.H.I. dispensing for 1915. This they soon regretted. The 1916 Drug Tariff terms resulted in a 17% reduction in remuneration although the authorities had claimed it woul be only 4%. With the exception of Boots, all the chemists refused to sign the 1916 contracts. Ultimately the Lancashire Insurance Committee persuaded Messrs Aked and Cuthberts to withdraw their resignations, and the others soon followed suit.

The Scottish chemists had also strongly objected to the 1916 terms and their determined opposition resulted in the granting of better rates than those accepted in England and Wales. An article from the *Pharmaceutical Journal* of 2 February 1916 is stuck in the minute book:

"It would appear that a Mr Elliott, the chemist at Coldstream near the Scottish border, was most incensed by the difference between English and Scottish terms, and resigned. In this, he was supported by the local doctor who refused to supply any medicines. Many possible alternative arrangements were considered by the Insurance Committee, but in the end they decided that there was no alternative to paying Mr Elliott the Scottish terms."

At the Annual General Meeting of 1918 an Order was received concerning the sale of the derivatives of Barbituric Acid, a forerunner of "Schedule Four". In November the Association was addressed by Mr F. Pilkington Sargent of Leeds, member of Council, who talked mainly about P.A.T.A. affairs, strongly criticising Elliman's Embrocation. He greatly favoured Council being elected on a territorial basis.

The P.A.T.A. again received much attention in 1919 and a resolution was adopted that minimum profits should be 20% on foods, 25% on preparations bearing Stamp Duty, and 33% on toiletries. The annual dinner was revived but obviously the Pharmaceutical Society was in disgrace, as it was decided not to invite any member of Council nor to include the Society on the toast list.

Mr Hines of York addressed the 1920 A.G.M., at which he spoke in favour of the Retail Pharmacists' Union. (The origin of the N.P.U. and the N.P.A. is to be found in the R.P.U.) This marked the beginning of the end of the Association. After a quiescent period of several years, in 1927 the Association funds were handed over to the R.P.U. local branch which had been founded in 1921

1. In January 1911 the Council of the Pharmaceutical Society decided to submit a revised curriculum to the local associations for comment. Council wanted to produce better trained pharmacists and reduce the number who failed the examinations. To achieve this it proposed that qualification should be based on a standard period of apprenticeship and three examinations, each preceded by a set course of study.

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Chesterfield and District Chemists' Association started later than Lancaster and had an even shorter life. The first meeting was held on 11 July 1911 and its prime purpose was to discuss the proposed National Insurance Bill. A resolution was passed approving the Pharmaceutical Society meeting Mr. Lloyd George and the resolutions put before him. On 17th. of that month a report was received from the deputation to the local Member of Parliament concerning the amendment to Clause 14 of the Bill.[1]

There were now fourteen members enrolled in the Association and Mr A.W.Greaves was elected president. In February 1912 the members agreed to subscribe to the British Pharmaceutical Conference and the Pharmaceutical Standing Committee. They also agreed after discussion of the Shops Act that in future their pharmacies would close at 1 o'clock on Wednesdays, 7.30 p.m. on Mondays, Tuesdays, Thursdays and Fridays, and 10.30 p.m. on Saturdays.

It was agreed on 15 October 1912 to join with the Ilkeston and Derby Association in a meeting called by the Pharmaceutical Society at Derby to discuss the Insurance Act regulations. November 12th saw the arrival of Mr W.J. Uglow Woolcock from London who put forward the Pharmaceutical Society's "official" view on the Insurance Act.[2] A letter was sent to the Insurance Committee for Derbyshire concerning the injustice of the "mile limit" after the 17 December meeting when it was also agreed to accept the Drug Tariff, even though it was an unsatisfactory means of payment because it reserved to chemists the bulk of dispensing business.

In the January of 1913 there was some grumbling about the poor percentage of profit given by certain manufacturers. They also agreed that a rota was necessary from 6 p.m. to 8 p.m. for Wednesdays, Sundays and Bank Holidays, and that an advertisement would be put in the paper to this effect. Price- cutting was concerning Chesterfield as it was Lancaster, but this Association was able to operate a successful co-operative buying scheme. They also considered the advisability of taking up Rexall agencies.

On 29 September 1914 it was agreed to send a donation to the Belgian Refugees Fund. During the year of 1914 to 1915 the new *British Pharmacopoeia 1914* was examined, and great dissatisfaction was expressed at the N.H.I. terms with the worrying possibility of discounting. Saturday night closing hour was lowered to 10 p.m. and the following year they decided to reduce the rota times to one hour, from 6.30 to 7.30 p.m. They also agreed not to accept scrips for "Rep. Mist.".

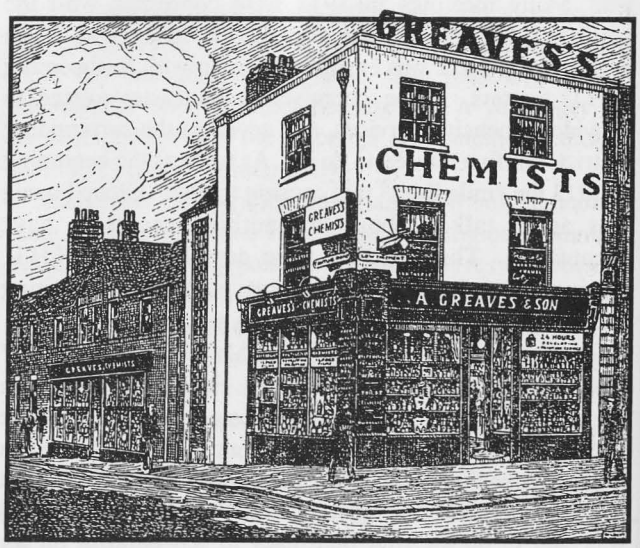
Mr G.D.Denwood, the Boots' manager, was elected president for the year 1916-1917. It was agreed to a lunchtime closing of 1 p.m. to 2.15 p.m., and that no glycerine was to be sold. At the March meeting the publication of a National Formulary was recommended. They also wanted 6d. for dispensing "Urgent" prescriptions after 8.30p.m. and a profit of 25% on-cost on all drugs and appliances. A paper was read by Mr H.Smith of Clay Cross showing that the pharmacist was better off, financially and socially, than he was 25 years earlier.

At first the N.H.I. terms for 1918 were regarded with greater approval but disillusionment soon set in again. The Association toyed with the idea of a 6 o'clock closing but decided it was impossible under the N.H.I. contract. Nevertheless in September 1918 it was decided "as a war measure" to do so ! A proposed byelaw dealing with poisons was strongly objected to, just as at Colchester, but in the long run Chesterfield's delegates voted for the measure.

During the 1920 - 1921 session the Proprietary Medicines Bill came under discussion, the majority favouring opposition to it. Wages for apprentices were informally agreed at 7s.6d. per week for the first year, 15s. the second year and 25s. during the third. Later in the year a protest was sent by members to the Home Office against the draft regulations of the Dangerous Drugs Act. It was also agreed that a branch of the R.P.U. should be formed and that Association members be recommended to join. The branch was formed in April 1922 and from this time onwards the Association lost its identity as a separate body.

1. The amendment to Clause 14 was designed to ensure that N.H.I. dispensing was done by pharmacists.

2. In 1911, in order to establish regular contact with the local associations W.J.Uglow Woolcock was appointed at £250 a year as a full-time Organisation Secretary. He was later to become Secretary to the Society and a Member of Parliament.



Market Place, Chesterfield

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Marion Merrell Dow - Historical Perspective of a "Merging" Company.

T.R.Irwin.

The name of the company gives a fairly good indication of the major enterprises which have come together to form the present firm, Marion, Merrell and Dow, but even then it is not complete. For example there should also be included the Italian pharmaceutical company of Lepetit, founded in 1868, which had been acquired by Dow in 1966. There is a limit to a company name, but its influence should not be lost since it discovered and marketed the important anti-tuberculosis drug, Rifampicin.

The pharmaceutical industry has seen a vast amount of global consolidation over the past number of years. Such activity has been at a very high volume during the last two years involving large companies which themselves had previously acquired a number of medium to small enterprises. Now they too were targets for acquisition, or else sought a secure haven through some form of merger. We have as examples of merging those of, Bristol Myers and Squibb, Marion and Merrell Dow, Smith Kline and Beecham, and Rhône Poulenc and Rorer. Whilst in the way of acquisitions there have been American Home Products taking over A.H.Robins, and Roche acquiring Nicholas Laboratories as well as a controlling interest in Genentec.

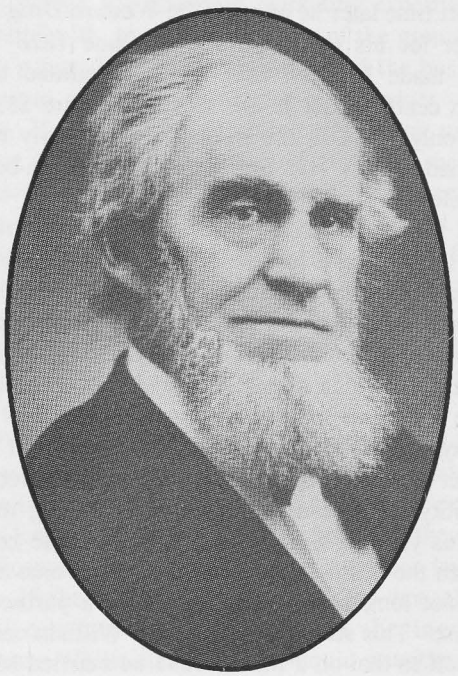
It is estimated that by the turn of the century fifty percent of the world-wide pharmaceutical market could be accounted for by fifteen companies as compared with twenty five in 1989. The reasons for this are principally related to the belief in large companies that they must be involved in the research and development for new and significant "blockbuster" drugs, even though they are subjected to ever increasing costs. The estimate has been made that the investment required for R.& D. to get a new chemical entity approved is around $230 million.

Yet product life cycles are shorter, technical obsolescence occurs more quickly and effective patent life is reduced. To offset these grave disadvantages there has to be greater sales revenue, and marketing which is global as well as wisc. The end result is that the industry polarises - large companies merge, medium companies are swallowed up and disappear. There is nevertheless a ready source of capital for the small entrepreneurial company, not necessarily searching for the large "blockbuster" drug, but rather for a product to meet a specific niche in patient needs.

The history of Marion Merrell Dow clearly illustrates the manner in which the individual strands of the present company came into being, developed, complemented each other and finally became integrated.

In the Beginning.

William Stanley Merrell was born in 1798, the son of educated farmers from the east of America. A small man, 5 feet 3 inches tall and only 8½ stone in weight, William looked deceptively weak and frail but lived to a flourishing 82 years of age. He worked very hard all his life, twelve to fourteen hours a day, and was the father of eleven children.



He was an abolitionist, even when such sentiments were very unpopular and threatened his profits. In his early years he was a Presbyterian who started his day with Bible reading and comments, and it is recorded that he attended church three times on Sunday. In April 1831 he joined seventeen other members of the First Presbyterian Church in organising a new Sixth Presbyterian Church in Cincinnati. They at once took an anti-slavery position, and their first act was to pledge for all their people, "entire abstinence from the use of ardent spirits except for medicine." In his middle years however he joined the Swedenborgians who were adherents of the Swedish scientist and philosopher Emanuel Swedenborg.

Merrell obtained a hard-earned college education in classics and chemistry at Hamilton College in Clinton, New York. He was not able however to be present in order to accept his diploma on graduation. The young chemistry graduate had worked his way west to Cincinnati and it was with his usual thriftiness that he waited 27 years until a business trip took him back east before receiving his diploma.

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His first venture in Cincinnati was a school of chemistry and allied science with the ultimate purpose of earning a enough money to complete a medical education. Through the school he made the acquaintance of many professional men and soon discovered the difficulty local doctors had in obtaining drugs from Philadelphia, particularly those of consistently high quality.[1] This provided the impetus for him to begin in a modest way the manufacture of pharmaceuticals.

A short time later he opened The Western Drug Store as an outlet for his products. On 10 June 1828 William Merrell made his first sale which amounted to about nineteen cents. Sales in the first week were $3.07, and rose to only $7.44 in the second. In his diary he noted that he had made a "poor beginning", but it was a beginning nevertheless.

Thus, Marion Merrell Dow can lay claim through its origins in 1828 to being the oldest continually operating pharmaceutical company in the USA.

At the end of May 1829, having almost completed his first year, Merrell recorded sales of $1,500 and a net profit of about $100 which represented about fifty percent of the $200 he had scraped together to start his business venture. Realising that his income was as good as most doctors, and that he was providing a valuable service to the community he gave up the idea of practising medicine. When his younger brother, Ashbel, offered to come and help with the business, William replied, "Come at once". It was not long before Ashbel became a partner in the enterprise. This steady progress gave William confidence in himself so that on 2 March 1831 he married Mehitabel Thurston Poor.[2]

In 1832 Merrell made his first transactions as a wholesaler when he shipped eight barrels of green or slippery elm (*Ulmus fulva*) to Philadelphia and New Orleans. The same year he set up a still designed by himself in order to make chloride of lime. Not long afterwards he was invited by The Eclectic Medical Institute of Cincinnati, where he had once studied anatomy, to prepare their botanical drugs in a more palatable form.

In the spring of 1847 when making an extract of podophyllum, he was successful in isolating the resin.[3] He proved to his satisfaction that this was the active principle, determined its role in medication and made it available to the medical profession. Others had discovered the resin before Merrell but his work was carried out completely independently. He went on to obtain the resinoid principles of other plants and turned his attention to alkaloidal extraction as well. Podophyllin and another product, Leptandrin, (a resinous laxative and bile flow stimulant extracted from *Leptandra virginica)* were for several decades leading Merrell specialities. The first order from London, England, arrived in 1857 and was for a pound of Podophyllin.

Merrell was also the first manufacturer in America to sell liquid alcoholic extracts of medicinal plants. They were to become the company's well known "Green Drug Preparations", the green drugs having been placed in alcohol when freshly collected in order to retain their medicinal value. By 1851 the extracts were rapidly growing in favour amongst his customers.

Writing for an 1851 advertisement, William Merrell announced that his plant medicinals were, "16 to 25 times the strength of the respective article in the crude or powdered states. They are neatly put up in one-ounce vials with appropriate directions to the profession for whose use alone they are intended, and sell at $0.75 to $1.00 per ounce. They have already become very popular and almost universally used in the eclectic branch of the profession by whom they were first taken up, and are well worth the attention of all who look for progress in medicine as well as other branches of science." Merrell advertising, while it claimed fine products, never entered the flights of exaggeration that characterised medical advertising in this period.

In the autumn of 1853, William Merrell addressed The American Pharmaceutical Association on the then new concept in pharmacy of "essential tinctures" which contained the drugs in concentrated form. The doctor or pharmacist could then add them to a syrup or other vehicle as required and caused the minimum of storage space problems. Merrell was soon attempting to supply druggists, pharmacists and doctors with every item they might need. By the mid 1800s the company was carrying approximately a thousand products in the catalogue and by 1899 something like two thousand products were recorded. as a result it was forever running out of production space, until finally in the 1930s the firm was moved to Reading, a suburb of Cincinnati, where it remains to this day.

William S. Merrell had originally embarked on a career in industry with the objective of earning enough money to become a physician. He was in fact to achieve this in 1862 when, aged 64, he was awarded the honorary degree of M.D. from The Eclectic Medical Institute of Philadelphia. Two years later he was made a trustee and vice-president of The Eclectic Medical Institute of Cincinnati, and in 1864 president of the trustees.

Generally speaking, William and Ashbel made a good team, the former forging ahead with new ideas whilst the latter fretted over the economics of innovation. They formed a stock company with some outside financial interest, and the name was changed from The Western Market Drug Store to The Merrell Company, with minor variations thereafter. A Merrell was head of the company for some 120 years; William led the company from 1828 to 1880, his son George was president from 1880 to 1914, to be succeeded in turn by his son Charles from 1914-1937, and finally from 1937 to 1949 Charles' brother,

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Thurston, was president. This Thurston was the last president to bear the family name, but another Thurston Merrell was in senior management until the mid 1980s.

The arrival of Vick's.

Twenty six years after William Merrell opened his Cincinnati drug store, Lunsford Richardson was born (1854) and reared on a farm near Selma, North Carolina, a small village about 27 miles north east of Raleigh. His father was drowned in a freak flood at the farm mill when Lunsford was still a baby so that his mother was left to manage the farm all through the difficult years of the Civil War and the hardship that followed.

Richardson left home when he was eighteen to enter Davidson College at Davidson, North Carolina, and because funds were short he succeeded in completing the four year college course in only three years. Although he was very interested in chemistry, he majored in Latin, and won the Greek Medal as well as that of the Debaters'. His knowledge of Latin was only useful in two occupations, that of a school teacher or a pharmacist. He tried teaching, did not like it, and decided on pharmacy.

After qualifying he bought a drug store in Selma from two local doctors for $450 which he paid off over a number of years.[4] A college friend introduced him to his sister, Mary Lyn Smith, the daughter of the pastor of the Presbyterian church in the nearby town of Greensboro. He, having settled his future career, now married. In 1890 when he was 36, Lunsford sold the drug store in Selma and moved to his wife's old home of Greensboro where he and a partner bought the shop of Porter and Tate which they ran under the name of Richardson and Ferris.[5]

The customers were mainly farmers who consulted the pharmacist rather than pay a doctor's consultation fee. The result was that Richardson formulated a number of home remedies which he sold under the name of Vick's. The name had been suggested to him by a magazine advertisement for Vick's seeds, and it was also the name of a brother-in-law. Eventually there were 21 of these Vick's family remedies. One of them, a vaporising salve for colds, later called Vick's Vaporub, became the product on which the business was to be built. Richardson had incorporated menthol, then a little known drug from Japan, into an ointment base containing rubifacient ingredients. By rubbing the ointment on the patient's chest, the heat of the body vaporised the menthol and so allowed the vapours to be inhaled for hours. Legend has it that he first made this salve for his son, Smith Richardson, who was described as a "croupy" child.

In 1898 Richardson, now 44, changed course. He sold his shares in the retail drug store and formed The Lunsford Richardson Wholesale Drug Company to sell his 21 Vick's family remedies, as well as the standard pharmaceutical items. At that time, however, wholesalers had very well defined geographical areas and he had great difficulty in trading his products beyond his immediate catchment area. Seven years later he sold his wholesale drug business and with his whole life savings of $8,000 founded the Vick Family Remedies Company which handled nothing but his own in-house developed Vick's products. He hired additional salesmen to obtain an increased geographical spread beyond his established catchment area but met with great resistance. His capital soon began to dwindle.

Whilst Lunsford Richardson set the tone for a growth business, it took the sales and marketing expertise of his eldest son, Smith, to get the business of the ground. One of Smith's first decisions when he joined the business in 1907 was to concentrate on only one product - Vick's Vaporub. He did this by allocating advertising money in proportion to the sales of each product, which meant that the Vaporub grew substantially and the other twenty remedies dropped away. Finally, Smith disposed of these twenty Family remedies by having them removed from the company warehouse while his father was at a religious convention.

Lunsford was furious at his son's action but did not re-stock, and Vick remained a one-product company until the 1930s.

In 1905 production of Vick's croup and pneumonia salve was two gallons a day. It had progressed from individually prepared prescriptions to pouring the petroleum jelly into large preserving pans, heating it, and then adding the medicaments. The secret of manufacture lay in the timing. If the petroleum jelly were too hot, then the essential oils vaporised; if too cold the ingredients crystallised. Whilst still in a semi-liquid state the product was poured into coffee pots, and finally was dispensed in little blue jars and labelled.

Such was the genesis of the Vick's Products Company. It had been founded by a man of high principle, one who saw to it that the principles that governed his home life were also applied to his business life. Lunsford Richardson had a particular interest in the welfare of black Americans. In 1944 a Liberty ship was named after him, "At the special request of the leading negro citizens of North Carolina in honour and memory of a white friend."

The Vick Chemical Company grew and expanded, and in 1938 merged with the pharmaceutical house of The William S. Merrell Company. The name of the new company was later changed to Richardson-Merrell in order to honour the two founders.

Further developments at Merrell's.

Merrell's earliest research accomplishment occurred in 1847 when William Merrell succeeded in isolating the resin from podophyllum root, a process which was applied to other plant products. The company was the first to make salicylic acid available to doctors in the USA.

Early in Merrell's history an analytical laboratory was

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established in order to increase the uniformity of its products as well as to improve formulation. It worked to such high standards that when the Food and Drug Act was introduced in 1907 the company had no difficulty in complying with the new requirements.

Before World War I pharmaceutical scientists began to move away from plant drugs to research into synthetic chemical compounds. Merrell's was interested in these new projects, and even throughout the late 1920s and early 1930s when times were financially very difficult, the firm continued with its research programme. More capital was needed in order to progress and this led in 1938 to the merging with Vick's which had the capital and wanted to diversify.

It was a wise decision by both parties. Three years later the new Richardson-Merrell company acquired the J.T.Baker Chemical Company, a firm with a long history in the development of high purity products for the exacting demands of research laboratories and high technology industries. Baker had not only insisted that his products should be as pure as possible but also that each batch of chemicals was to be analysed for any impurities that might affect its use. The type and amount of any significant impurities were then listed on the label - a practice which distinguished his company from all others.

In the post World War II era Richardson-Merrell expanded their research programmes, and as a result financial demands became very great. The research programme had resulted in a number of promising compounds, but their full development to the market place required large investment, one so massive that the company did not want to sustain at that time. So it was in 1981 that The Dow Chemical Company acquired the Merrell Division of Richardson-Merrell.

The Herbert Dow story.

The Herbert Dow story is similar in many respects to that of William Stanley Merrell and of Lunsford Richardson, but there are a number of important differences. In the case of Merrell capital resources had been required for research and development, Richardson's had required them for marketing, but in Dow's situation they were needed for plant and process development as well as chemical research.

Again, the story of The Dow Chemical Company is a story of one man's inventiveness and determination to succeed. Herbert Dow was born in Belleville, Ontario in 1866, the son of Joseph Dow, a descendent of an old New England family. The first Dow to come to America was Henry Dow who arrived in Massachusetts from England in 1637.

Part of Herbert's inventiveness could no doubt be traced back to his father, a mechanical engineer and an early pioneer of steam turbines. The family moved in 1878 to Cleveland, Ohio, where Herbert Dow entered the Case School of Applied Science. He had wanted to be an architect but his parents could not afford to support him in study away from home.

At Case, when asked what he intended to do on leaving school, he replied that he would, "rather work for myself for $3,000 a year than work for someone else for $10,000." It was while preparing his thesis on the chemistry of boiler fuels that he became interested in extracting bromine from the brine that often gushed out with the crude oil and gas from the petroleum wells. Bromine was, at that time, an important ingredient in patent medicines and photographic materials; most of it was exported to the USA from Germany, and Germany dictated the price.

The manufacture of sodium chloride or salt from brine is a relatively simple process. The brine is heated until evaporation causes the salt to crystallise out, and the liquid left, the bittern or mother liquor, contains the bromine. If the bromine is required, then chemicals are added to "free" it, and the mother liquor heated until the bromine is carried off with the steam. These processes, to be profitable, require a cheap source of fuel, but by the time of young Dow the giant forests of Michigan and Ohio were disappearing. Dow recognised that this method of obtaining bromine was wasteful and inefficient, and set about finding a better method. This attitude was to become a maxim of the company, "If you cannot do it better, then don't do it."

After graduating from Case in 1888, he obtained a job teaching chemistry in Huron Street Hospital College, Cleveland, in whose laboratories he was able to pursue the bromine problem. His first process was to pass a current of cold brine, which had been treated chemically to free the bromine, over scrap iron; the moisture that was collected contained ferric bromide. He called this, "the blowing out process".

He raised money to form The Canton Chemical Company in Canton, Ohio so as to exploit the process. The venture failed, but failure was not so much due to the process as to the difficulties in pumping the brine from the very deep wells he had acquired.

By now, however, Dow was thinking of using an electric current to liberate the bromine from the brine in conjunction with his "blowing out process". Dow was by no means the first to think of electrolysis in the manufacture of chemicals, but the cell he devised was unique in its simplicity and design, and eventually became the foundation of Dow's success. His electrolytic cells were built from cheap wood coated with tar. A fifteen volt generator, turned by a steam engine, was used to make his own electricity.

The following years were ones of very hard work with the formation of another company in Midland, Michigan, called the Midland Chemical Company. He then went on to extract the chlorine from brine, but came under great

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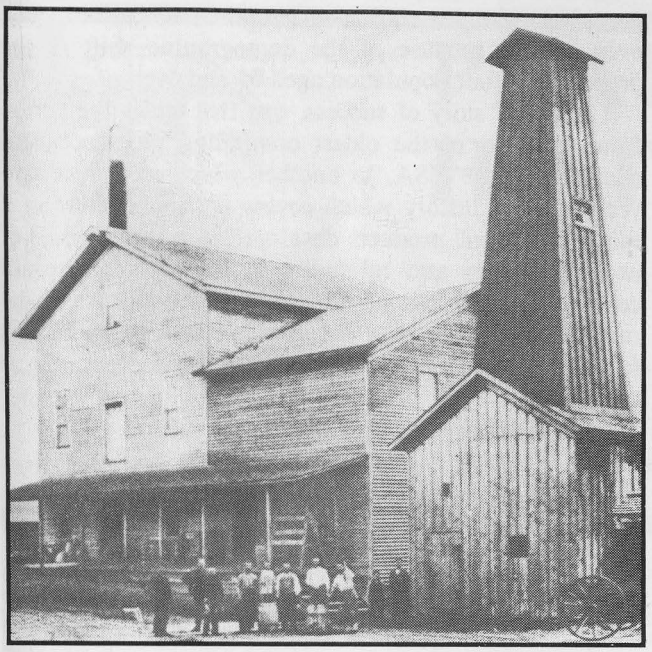

Scene of Dow's first successful electrolysis of brine in Midland's Main Street.

criticism and increasing strictures from the backers of the Midland Company. Eventually he was deposed as General Manager and he left the company he had founded.

He was now 29 and his seven years in business had been a series of disappointments, but nevertheless he was far from daunted. Once more he obtained financial backing and now formed The Dow Process Company in Navarre, Ohio, about three hundred miles south of Midland. Later he was able to make a deal with his old Midland Chemical Company to use their waste brine, after the removal of the bromine, for the manufacture of chlorine. Thus he returned to Midland which is still the headquarters of the Dow Chemical Company.[6]

The manufacture of bleach requires volume production. Dow had plans for this but needed a much larger capitalised company. This led to the formation of the Dow Chemical Company in 1897 with strong financial backing, and with Dow as its founder, a high level of innovation and inventiveness. Shortly after his 31st birthday he absorbed the Midland Chemical Company into his Dow Chemical Company.

By the end of the century he had proved that his bromine and chlorine processes were sound both chemically and commercially. He did not have complete control over the companies he had been instrumental in founding but had a strong voice in their management. The inventiveness that led to the Company's foundation was the basis for its success in the years to follow.

The chemical industry is very much volume dependent, with the economy of scale being the main determinant of profitabilty. When it is operating at capacity or near capacity, it can be very profitable but when production declines in times of recession then profits rapidly decline. The Dow Chemical Company was determined to try to smooth out these cyclical swings, and the method they chose was to increase their presence in pharmaceuticals which are less subject to this fluctuation.

Dow had already acquired the pharmaceutical companies of Pitman Moore in 1961 and Lepetit in 1966 but now the need to expand further in this field had been identified it was decided to acquire Merrell, the research based medicines division of Richardson-Merrell. Thus the firm of Merrell Dow was established.

Recent History - The Marion Story.

By 1989 the Merrell Dow Company had global sales of around $1.3 billion and was clearly successful. It had a presence in all the major markets and a productive research and development function. However the same economic factors applied to Merrell Dow as they did to the whole industry and the corporation decided that it should have a strategy of doubling in size very quickly. It was this analysis which led to the search for an acquisition or merger partner.

Such a partner was found in Marion Laboratories, a company of $930 million sales and only operating in North America, and so was a perfect complementary fit. Additionally, it did not have any basic research of its own but relied on in-licensing products from other companies, although it had a product formulation and development capability. The result of such a merger was a doubling of sales without a doubling of basic research and no conflict from duplication in countries other than the USA, where both companies wanted to expand their operation anyway.

The founder of Marion Laboratories was Ewing Marion Kauffman, born in 1917 and descended from German stock on one side of his family and Scottish/English on the other. His is the classic tale of the Missouri farm boy who, through a policy of sharing with others, built a huge pharmaceutical company, and in the process, a large personal fortune.

The family had lost its money farming and moved to Kansas City in 1928, when a severe illness left young Ewing with a faulty heart valve. The prescription was a year in bed flat on his back. He took to reading and was consuming about three to four books a day. This capacity for speed reading of around 3,000 words per minute has remained with him. He can read an average length novel with adequate comprehension in a couple of hours.

After service in the navy during World War II, he went to work as a medical representative for a pharmaceutical company in its Kansas City territory. Within a few years his income reached $18,000 a year. This was more than the president was earning, so they cut his commission

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and kept trimming back his territory as his sales volume grew. Finally, he left the company.

He put his savings, which amounted to less than $5,000, into what was to become Marion Laboratories. He started making vitamin tablets, filling bottles with the tablets at night and selling during the day. He learnt of the possibilities of calcium tablets made from oyster shells to correct calcium deficiency. He investigated their merits for calcium supplementation, and then committed all his financial resources into developing and making a new product, albeit only in the North American market.

In 1952 he incorporated his one-man business, invited seven friends to invest $1,000 each and persuaded them to buy a $1,000 bond on which no interest would be paid. It took two years before a profit of $6,000 on a sales volume of $176,000 was shown. Five years later sales had reached $1 million - and in the 25th year sales were $84 million. At the time of the merger with Merrell Dow in 1989 sales had reached a staggering $930 million.

Those shareholders who had shown faith in Ewing Kauffman in his early years went on to become very prosperous indeed. Learning from his own early experience as a medical salesman, he developed a profit sharing scheme for his employees who thus benefitted immensely from the success of his company. His maxim was, "Those who help create the benefits shall share them."

Mr Kauffman is a philanthropist with a particular interest in helping at-risk children to become productive members of society. In his rise to fortune he also acquired the Kansas City Royals when there was a possibilty of them being lost to the city. In cities like Kansas, the retention of a successful sports team is considered a decided asset to the community.

In summary then, the history of Marion Merrell Dow is a fascinating one; one which demonstrates very clearly the factors at work which have shaped the pharmaceutical industry in the nineteenth and through into the late twentieth century. A study of the past indicates the likely responses that industry is going to have to make as it copes with the demands of the future. A demand made even greater because of the demographic shift in the proportion of our population aged 65 and over.

It is also a story of success, one that spans the period from the start of the oldest continuing pharmaceutical company in the USA, to another which is a mere two years old. A history which covers the introduction of a range of "green" products developed to meet demands of uniform quality and reliability in the early nineteenth century, through Podophyllin resin and synthetics to the recent launch of Sabril (Vigabatrin) which brings benefit to patients' with hitherto resistent epilepsy.[7]

Notes and references.

1. Philadelphia was then the drug supply centre for much of the USA.
2. The name Thurston was to be a family Christian name in the company's senior management for many years.
3. The dried rhizome and roots of *Podophyllum peltatum* are valued for their laxative action, and as a paint, for antimitotic properties.
4. Doctor dispensing and the ownership of pharmacies is no new phenomenon!
5. Dr Porter was the uncle of William Sydney Porter who had been a drug clerk in the store and years later became famous as a short story writer under the pen-name of O.Henry.(1862-1910)
6. Midland is very much a company town, its commercial and social life being completely intertwined with that of the company.
7. Based on the theory of gamma-aminobutyric acid's involvement in epilepsy, scientists in Merrel Dow's research laboratories looked at ways of naturally increasing this neuro-transmitter. Sabril irreversibly binds to GABA transaminase (the enzyme responsible for the breakdown of GABA) and is excreted unchanged. This "suicide inhibitor" results in the natural build-up of brain GABA, and makes Sabril the first rationally designed anti-epileptic drug.

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2. S.Richardson, *The early history and management philosophy of Richardson Merrell.*
3. D. Whitehead, *The Dow Story.*
4. P.A.Kong, *A character study of Ewing M. Kauffman.*

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PHARMACEUTICAL HISTORIAN

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Contents.

Diary Dates.

Wednesday, **9 November 1994.**
Dr. J. Aronson, "The Foxglove Saga"

Monday, **19 September 1994.**
British Pharmaceutical Conference History Session.

Venue: The Wellcome Institute for the History of Medicine, 183, Euston Road, London.
(Close to main-line stations of Euston, King's Cross and St. Pancras, as well as Euston Square Underground station.)
Time: 12 mid-day until 2.0 p.m.
Speaker: Professor Vivian Nutton of University College London and the Wellcome Institute.
Title: "Scribonius Largus: the first pharmacologist."

Members and their guests invited.
Advance booking is essential

Tickets £5 which include sandwiches, fruit and coffee
Obtainable from: Dr L.Howden, B.S.H.P, 36 York Place, Edinburgh. EH1 2HU.

Society Members' Activities.

On 11 May 1994, the new curator of the Royal Pharmaceutical Society's museum, Miss Caroline Reed, gave an address to BSHP and the Pharmaceutical Society on "The role of a specialist museum". She discussed the task of interpreting such collections and presenting them to the wider public.

Emeritus Professor David Cowen of Rutgers University who is an honorary member of BSHP has received more well earned tributes. The American Institute of the History of Pharmacy symposium on, "The Evolution of American pharmacy", was held on 21 March 1994 at Seattle, Washington, and was opened with a "Tribute to Professor David L.Cowen on the 60th. anniversary of his First History of Pharmacy Publication." It is particularly delightful to report that Professor Cowen particpated in the symposium by presenting a paper on "The Development of State Pharmacy Law." Nor is this all, on 30 April he was the recipient of the Continuing Lifetime Achievement Award of the American Association for the History of Medicine at the annual banquet of the association in New York. This award is especially apposite because he is currently hard at work writing biographical sketches for a forthcoming *American National Biography* by Oxford University Press - thirteen done and four to go.

Besides his interest in pharmaceutical history, Tony Yoward is a keen local historian, and recently has been researching into the history of Lumley Mill near Emsworth. The mill was situated on the Sussex bank of the River Ems and named after Lord Lumley who built it in the mid 1700s. In 1802 it was sold to Edward Tollervey who built the millhouse which still stands. Tollervey was a war

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profiteer of no mean acumen and had built a range of ovens and pigsties. Corn was ground and biscuits made to supply Army and Navy contracts in Portsmouth; the grist and broken biscuits fed the pigs which were then sold to the military. Soon after the end of the Napoleonic war when defence contracts were cancelled, he was bankrupt.

In the 1850s, James Terry, miller, maltster and farmer purchased the mill and when he died in 1906 he left the mill to his nephew James Alfred Terry. Stone flour milling stopped in 1913 when it became uneconomic to continue and Terry sold the mill in 1915; it and the grain store were burnt to the ground on Monday 24 May 1915. Miss Terry the daughter of the miller gave the following verse to Mr Yoward:

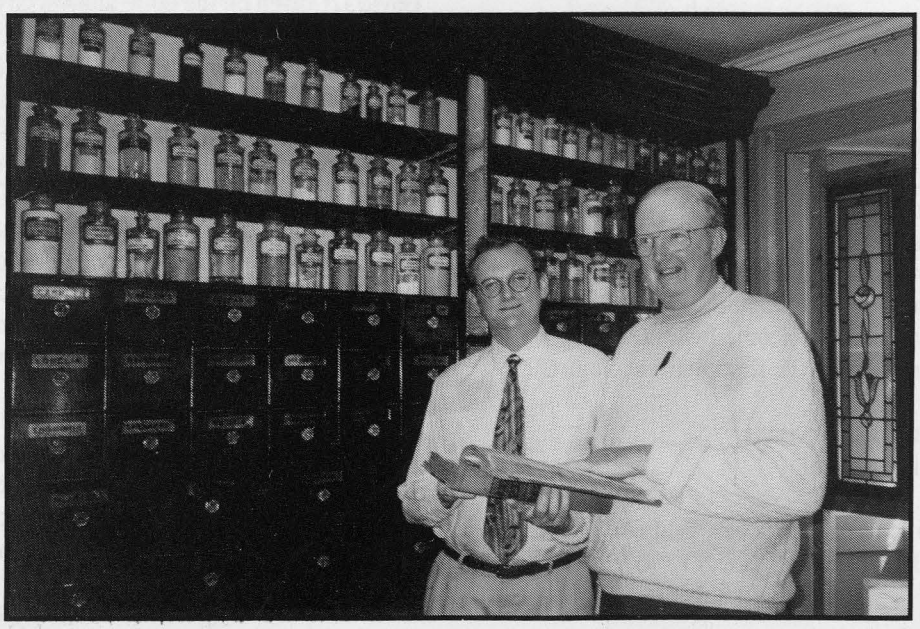
Without consulting any M.D., all at once my voice is free!
Nor is it long to tell throughout how liberation came about.
I sought a Chemist of renown residing here in Emsworth town,
Then hoarsely whispering my demand,"Brown's Troches",
he put within my hand,
And said, "If Clergy it had cured, an Artist well might feel assured"!
Troches in French word-book soon I learn,doth "Fumets" mean and this in turn
Bailey's lore at last made clear, I had been cured with dung of deer.

This had been written by William Buckler in September 1881. He was an artist and entomologist who lived at the mill from 1848 until his death, aged 70, in January 1884. He was a painter but photography replaced his skills; his collection of moths and butterflies is at the Natural History Museum in South Kensington. The chemist referred to was Henry Griffiths Walters who was in business in High Street, Emsworth.

It is always a happy occasion to welcome BSHP members from overseas to these shores, the latest being Geoff Miller of Western Australia of whose Pharmaceutical Society he is a past President. Last May, he and his wife Mary en route for Oban, Scotland to visit one of their sons, called in at Manchester to see our immediate past President, Bill Jackson, and also at 36, York Place, Edinburgh. There, as our photograph shows, he was entertained by Lindsay Howden.

The Jerry Stannard Memorial Award for 1994 has been divided between Dr Maren Hellwig of Germany and Walton O. Schalick III of the USA. Dr Hellwig's paper was entitled, "Grains of Paradise...A spice from West Africa in early modern Göttingen". Archaeologists have recovered the remains of many edible plants from a sixteenth century privy in that town. The rarest find was some seeds of *Aframomum melegueta*, a West African spice commonly called "Grains of Paradise". She described the plant and its seeds botanically and traced the history of its use in Europe from the thirteenth century to the present.

The title of Mr Schalick's paper was "Add one part pharmacy to one part medicine:apothecaries and the medical faculty in thirteenth century Paris." The spice trade was then conducted by various guilds of which the apothecaries were medically the most important. The faculty of medicine attempted to supervise them as early as 1271 and finally attained this goal in 1336 by royal edict.



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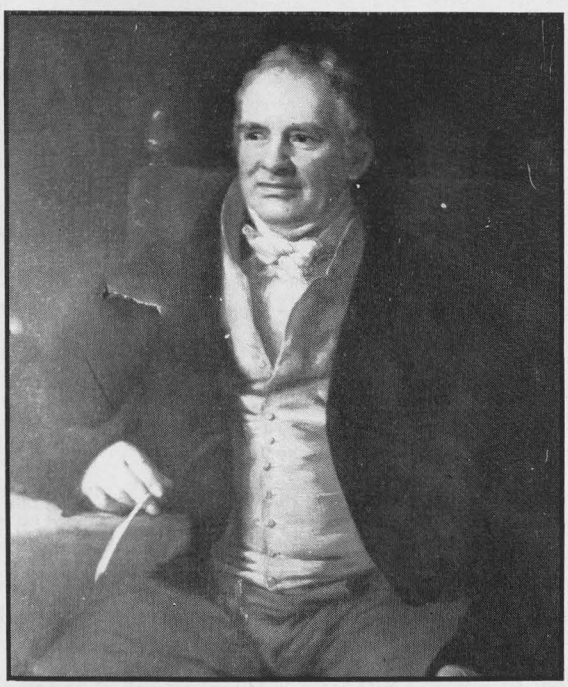
THE DERBYSHIRE GENERAL INFIRMARY.

Dr V.M.Leveaux.

At the end of the eighteenth century Derby had a population of some eleven to twelve thousand but unlike the neighbouring county towns of Leicester, Lincoln and Nottingham had no general hospital. At this period there were 31 general hospitals in England alone which had been established by moneyed people with a concern for the sick poor. Derby may be said to owe its general infirmary to William Strutt, FRS, (1756-1830) son of Jedediah, former wheelwright and later hosier and cotton spinner. William was not only an industrialist but an inventor and engineer who built in 1793 what was described as the first fire-proof mill. In fact Strutt was responsible for both the birth and the death, as will be seen, of Derby's first general hospital.



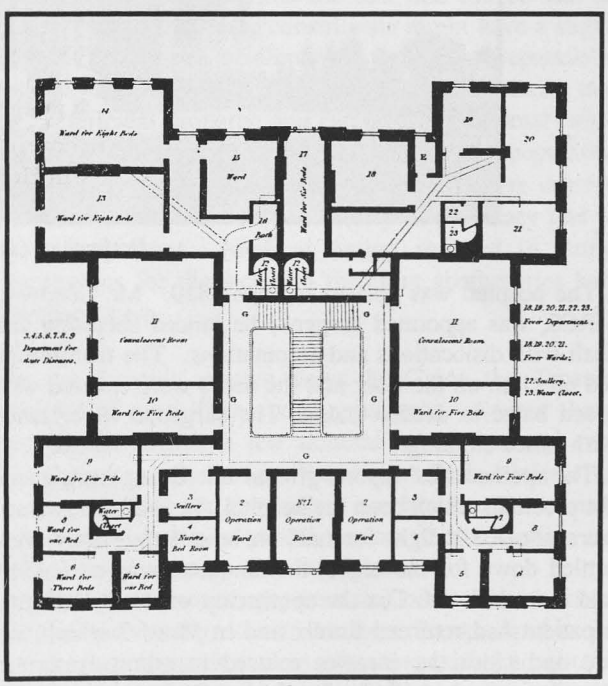
William Strutt F.R.S.

William, like his two brothers, was on the Subscribers' Committee set up in 1803; the following year fourteen acres of land were bought and an advertisement placed for people to submit plans for the hospital. The winner was to be awarded £20 but in the end none of those submitted proved acceptable. The sub-committee proposed a design presented by William Strutt which was adopted. Drawings were made by Samuel Brown from this design which incorporated many of Strutt's inventions and the construction carried out by an engineer Charles Sylvester. Later Sylvester was to write a book, *The Philosophy of Domestic Economy*,(1819) which dealt with the problems of providing washing and heating facilities in large institutions.

In appearance the Infirmary was like a handsome Georgian country house with the lowest floor being partly below ground level. The middle floor was devoted mainly to administration and to a few wards, although most of them were to be found on the third floor. The operating theatre was situated over the portico, and on the roof was a dome which bore a nine foot high statue of Aesculapius.

The building held eighty beds, two day rooms and fever wards which were quite separate from the others, although within the same building, and had their own laundry and post mortem rooms. On the roof were turn-caps which turned into the wind and were connected by great flues to a stove; it was in effect an early form of air conditioning.

The wards on the top floor were small, some only with three beds, and grouped round a water closet, an unusual feature in the early nineteenth century. The lavatories were so built that fresh air came in on opening the door. There was a convalescent room, and above, another turn-cap which in this case turned the opposite way in order to extract air. Another unusual feature was the post-operative ward.



Plan of the upper storey.

The out-patients were seen on the second floor where was the self-contained fever block. Also to be found here were the physicians' and the surgeons' rooms as well as that of the apothecary. The apothecary, although not much

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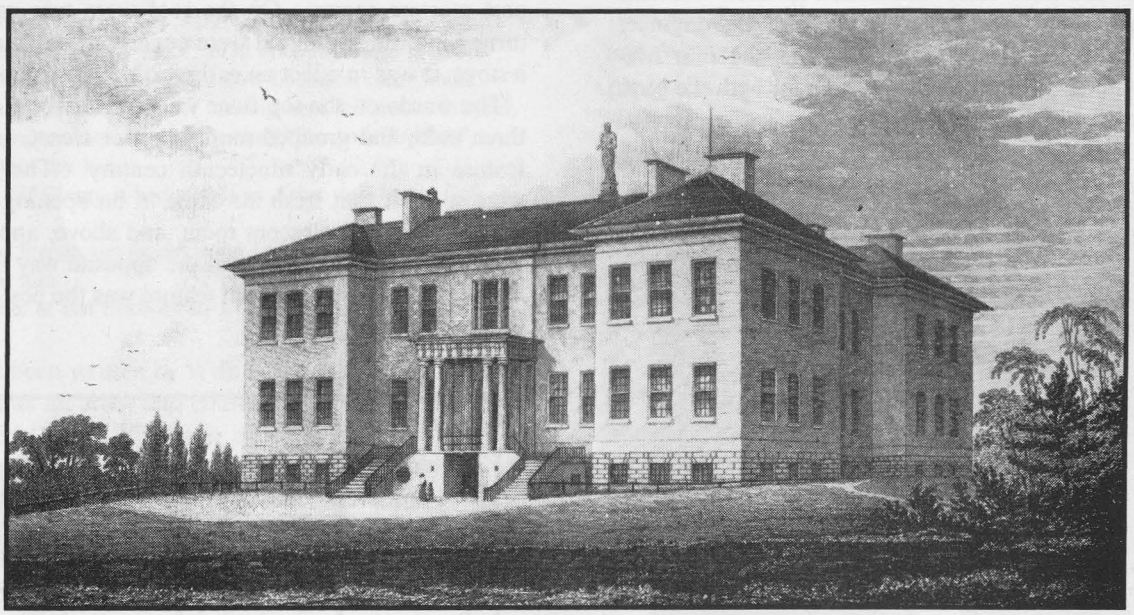
regarded, held an important position in the running of these early hospitals. He was the resident doctor who worked under the guidance of the honorary physicians and surgeons. He was responsible not only for the dispensary but for administering glysters to male patients, applying pledgets, the maintenance of electrical machines and baths, collecting money from patients and keeping the accounts. All meetings were attended by him and he wrote up the minutes afterwards. We know that at the Nottingham Hospital he received £30 a year plus a gratuity of £10 if he stayed a year, as well as free tea and sugar, lodging and washing. He was allowed to take a non-resident pupil and also to take an apprentice - but not both at the same time.



Derbyshire General Infirmary in 1819

The hospital was opened in June 1810. Mr Goodwin, MRCS, was appointed surgeon; he lanced abcesses, and dealt with dislocations and amputations. The theatre had red oil cloth on the floor and the doors were covered with green baize to deaden sound. The surgeons were issued with calico clothing.

The apothecaries' reports give an interesting insight into the problems which beset the hospital. In 1825 the patients were allowed a light for half an hour before they were settled down for the night; the amount spent on leeches had increased. Mr Dix the apothecary wrote in 1837 that a patient had returned drunk, and in Ward 7 which was hot and close the inmates refused to admit fresh air. Another patient in 1840 refused to go to prayers, and a Mr Wright the following year was caught smoking, whilst in 1842 a certain Hannah Blood caused a "News of the World" scandal.

The railway came to Derby in 1839 with the result that the population increased rapidly and there were soon insufficient beds in the hospital. A new fever block of sixty beds was added, as was a locked ward for the treatment of venereal diseases. During the 1850s there was an increasing number of complaints of smells in the hospital. Visitations from sanitary inspectors were made and in 1862 the infirmary was condemned as obsolete.

In 1860 a William Ogle was appointed physician and during the years 1864 and 1865 he wrote eight letters to Florence Nightingale, most of them relating to the fever wards. Francis Wright who ran an engineering firm at Ripley became Chairman of the Governors in 1870, and at his own expense, decided to upgrade the hospital. A lift was installed, an eye department started, and the ground surrounding the building lowered.

A new wing comprising two wards was added which was designed on the lines of those at St. Thomas' Hospital in London. The cost was £19,000 and the wards were known as the Nightingale Wards. There were now 175 beds. However all was still not well. In the 1880s there were even more complaints of noxious smells, even in the new wards, and the nurses became ill.

Then in October 1890 there was a report of sewer gas being found, and a nurse, Miss Cross caught typhoid fever and died. Inspectors came up from London when it was found that all the drains and air ducts were hopelessly mixed up, some were cracked and none had been cleaned since they were installed. William Strutt's far-sighted but complex designs were now pronounced to be the cause of the hospital's death sentence.

Whilst re-building was in progress the patients were housed in wooden huts in the grounds. Five men were killed when the old building was demolished. In 1891 the foundation stone of the Derby Royal Infirmary was laid by Queen Victoria, and three years later the first ward of the new hospital was ready for occupation.

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MEDICAL FICTION AND PHARMACEUTICAL FACTS ABOUT THERIAC.

Dr.A.I.Bierman.

The "Four Officinal Capitals", Mithridatum, Venice Treacle, Philonium and Diascordium have been used for almost two thousand years. Up to the beginning of the nineteenth century they are to be found in almost every European prescription book. They had much in common. Originally, they were all used as an antidote but later came to be administered as a cure in almost all diseases including pestilence and cholera. A real boon in the use of Theriac can be seen in the seventeenth century when Europe was again plague infested. As for their components, it can be said that they all contained opium and that they were all delivered as an electuary.

The most famous of the four was Venice Treacle. Its story began some hundred years before Christ, in Pontus, a kingdom in Asia Minor. The king of Pontus, Mithridates, the sixth of this name and commonly named "the Great", was so afraid that one of his many enemies would one day poison him that he daily dosed himself with an antidote. According to some, he invented this himself but others say the secret was communicated to him by a Persian physician. The legend relates that Mithridates was very successful with his prophylaxis, so much so that when his own people led by his son rose in revolt he tried in vain to take his life by poison. In the end he had to ask one of his soldiers to kill him.

Soon afterwards the Romans conquered the kingdom of Pontus, and returned home with much booty including Mithridates' antidote. In Rome the emperor Nero was most interested in this preparation as he also had good reason to be afraid of being poisoned. Nero's physician, Andromachus, was ordered to investigate it and see if it were capable of improvement.

Andromachus is said to have made some alterations and presented the new recipe, now named Theriaca Andromachi, to Nero. The new formula was given in Greek verse for which A.C.Wootton, in his *Chronicles of Pharmacy*, makes an attractive explanation. He suggests that the object of giving the formula in verse was to make it less easy to modify. Wootton believes however, and he gives abundant reasons for his viewpoint, that both the antidote of Mithridates and the new formula were invented by the Romans. In his opinion the legend of Mithridates' immunity was the propaganda of some clever advertising quacks in Rome.

The essential change in the prescription was the addition of snake flesh. In those days people believed that a venomous snake, having so much poison in his bite and therefore in his body, must keep a powerful antidote in his body as well otherwise the snake would die of his own poison. The best vipers were said to come from Venice.

Why did this formula of Andromachus become so famous and was in use for some two thousand years because at the time of which we are speaking a number of antidotes and theriaca were in use? Mr G.Watson published an excellent study about Theriac and Mithridatum in 1966, and discusses in detail the many antidotes that were in use. In theory other formulae could have withstood the ravages of time just as well. The answer however is easy.

Theriaca Andromachi was promoted by Claudius Galenus himself, the famous physician from Pergamon who lived 130-210 A.D. Galen strongly recommended the use of theriac and he valued the Andromachus formula above all others. In his books about antidotes and theriaca, Galen praises the virtues and powers of the Theriaca Andromachi. Galen's authority remained almost unchallenged up to the eighteenth century so it is understandable that Venice Treacle kept its leading position through the centuries.

The medical grounds for its use became adapted to all the diseases and plagues that mankind suffered. By the sixteenth century the word "theriac" had become a kind of generic term for an universal drug, as the French say, "a panacea". Studies of the formulae of all the theriaca recorded show however that the best that can be said of them is that the balsamic constituents might have a slight antiseptic effect upon the alimentary tract. The preparations could have had no real remedial value in any diseases, nor any bactericidal property, and certainly no antidotal value in cases of poisoning. It is suggested that the real popularity of the theriaca was due to the fact that they were usually taken with wine! But for the history of pharmacy this is not so important. Medical fiction resulted in many prescriptions for theriaca and therefore apothecaries had to prepare them.

In the formula written down by Galen the Treacle consisted of more than sixty ingredients. Among them were squills, herbs, a few mineral substances and two animal compounds, castoreum and viper flesh. Galen also gave instructions for the correct preparation, but during the following centuries quite a number of alterations were made, partly for purely practical reasons.

Most of the balsamic ingredients and herbs in the formula of Galen were indigenous to southern Europe, and as in northern countries they were often impossible to obtain they were re-placed by others. Another solution was simply to leave out the ingredient. Nevertheless a close look at the various formulae for Theriaca Andromachi shows that viper flesh was never left out. Vipers were an essential part of this theriac, and the people of Venice, who pretended to make the best theriac of all, sold their vipercakes all over Europe.

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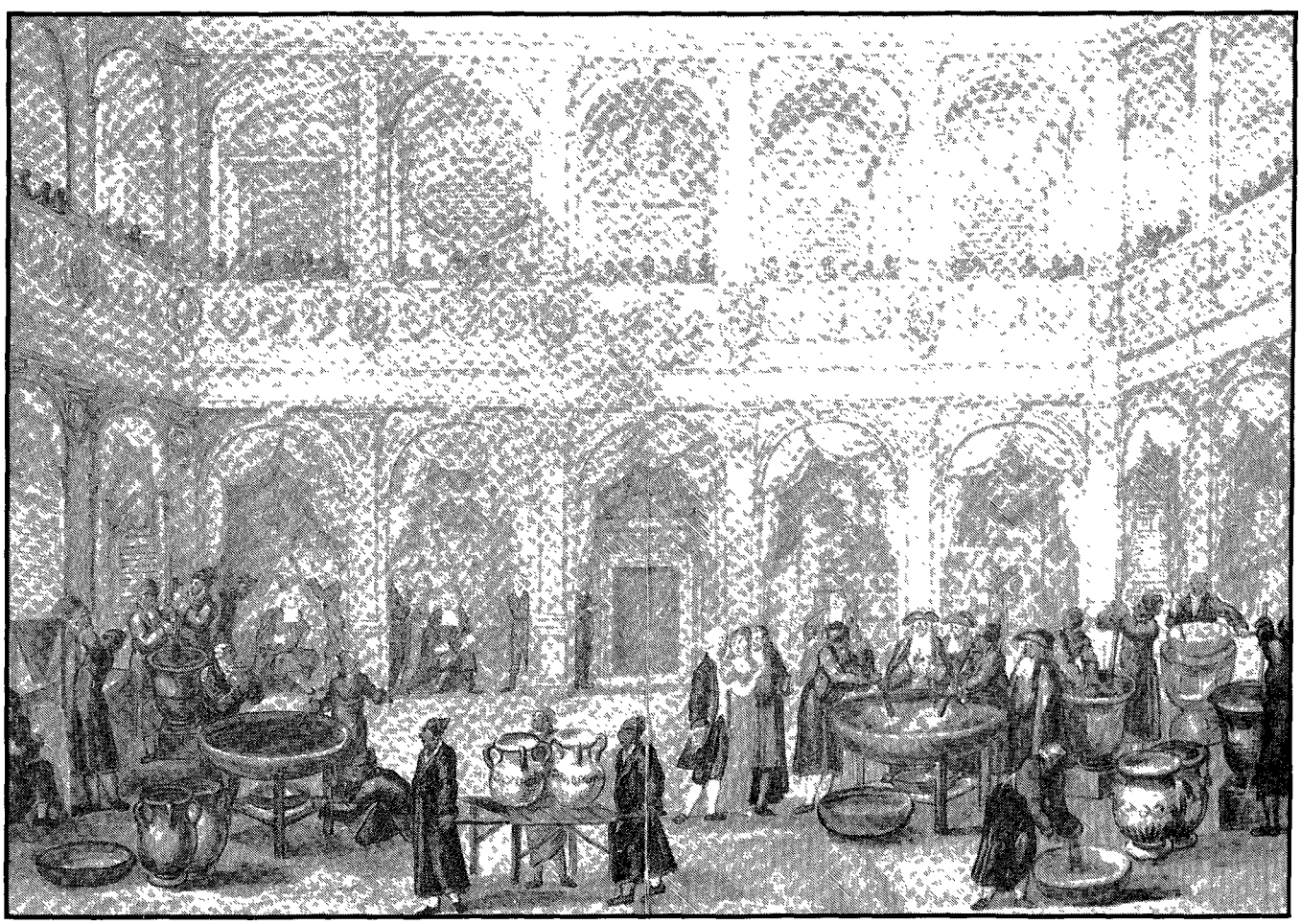
"Trochisi Viperarum" consisted of boiled viper flesh mixed with breadcrumbs. In Venice the vipers were bred for this purpose in viper gardens because the merchants did not want to be dependent on a fitful supply from other parts of Italy. With this viper breeding they were never out of stock, and moreover, they could guarantee the high quality of this important merchandise.

There were other reasons for alterations in the original formula. As mentioned earlier, the word "theriac" became a synonym for a powerful drug so that the original prescription was modified many times. Other theriaca bore the name of their inventor or the name of the region where they were prepared. In Britain a celebrated theriac of the seventeenth century was the one invented by Sir Walter Raleigh while imprisoned in the Tower. This preparation was adopted in the *London Pharmacopoeia* under the name of Confectio Raleighana. In the same century, in France, Theriaque celeste was famous; this particular theriac was probably the most expensive ever made because it contained pearls, garnets, rubies and emeralds. Conversely, for the poor there were cheaper recipes, the Theriac pauperum being made from only cheap ingredients.

If we compare the various modified prescriptions for theriaca during the seventeenth and eighteenth centuries it becomes clear that in the course of time almost all of them were simplified. Kornelis Elzevier, a Dutch poet and pharmacist, wrote in the middle of the eighteenth century his *Lexicon for Apothecaries*, a collection of all those prescriptions used at that time in the Netherlands. Elzevier gives as many as 39 formulae for various theriaca, the original Theriaca Andromachi - with viper flesh - still being in force.

The preparation of Theriac.

Here we find fundamental differences between the preparation of Theriac on the European continent and that in Britain. Already as early as the end of the fifteenth century in the Netherlands local regulations were issued for its preparation. The apothecaries had to make theriac under supervision of the doctors, and in several towns special supervising committees were installed. In the seventeenth and eighteenth centuries the preparation of theriac became public ceremonies which have been reported



Ceremonial preparation of theriac in late eighteenth century Italy

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by contemporaries in paintings and words. John Evelyn for example describes the making of treacle in Venice as follows: "Having packed up my purchases of books, pictures, casts and treacle (the making and extraordinary ceremony whereof I had been curious to observe, for it is extremely pompous and worth seeing), I departed from Venice."

In general all these ceremonies were similar. First, all ingredients were displayed so that the inspectors could be convinced of their quality; citizens were welcome to take a look as well. The illustration of such a ceremony in Bologna shows the apothecaries working in a large room, the inspectors sitting in the corner or looking around, and many people standing in the balcony to see how theriac is made.

Public inspection by physicians in 1505

After inspection the real work of preparation could start. All the ingredients had first to be pulverised, and this could take days. Here the inspectors had another important task. They had to take care that the ingredients already displayed were indeed the same as the ones that went into the mortars. The apothecaries - may it be true or not - were accused of tricks at this point. In the Netherlands severe accusations came from Doctor Cornelis Bontekoe, the doctor who prescribed tea as a remedy for almost all diseases, so that we call him the "Tea-doctor". Bontekoe said that the apothecaries gave the inspectors much wine to drink so that the world became a bit misty for them, and their attention slackened. At this very moment the apothecaries unnoticed, exchanged the expensive ingredients for cheaper ones. The original expensive ones were removed and safely put away to be displayed again at the next theriac ceremony.

Usually many years passed before the next theriac preparation. According to Galen, theriac reached its greatest activity six years after preparation, and the drug kept its virtues for forty years. Consequently, the preparation being such a vast task and given the long life of theriac, it was very attractive to prepare large amounts at any one time. In Maastricht, (a city which has a certain notoriety in our time) in 1712, 150 kilos of theriac were prepared at one session.

In Britain however these ceremonies did not take place. According to Wootton by the sixteenth century in the reign of Elizabeth I, English apothecaries claimed that they could make the confection just as well as their Italian contemporaries. They even claimed that the British product was superior to the imported one. Wootton quotes from a pamphlet of 1585 written by Hugh Morgan, apothecary to the Queen, in which he said that his own theriac had been compared with imported products and had received commendation. He lamented that, "strangers do daily send into England a false and naughty kind of mithridatum and treacle in great barreles more than a thousand weight in a year and utter the same at a lower price for 3 pence and 4 pence a pound to the great hurts of her Majesties' subjects and no small gain to the strangers' purses."

From Mr Leslie Matthews' study of the royal apothecaries we learn that Morgan's colleagues were not at all convinced that his treacle was superior to their own product. Furthermore, the Grocers' Company objected to receiving by Mr Morgan's hand a formula for the composition of treacle. The Court Minutes of the Grocers' Company show that the quality of treacle was a constant source of trouble for many years and several members of the Company were fined for selling unsatisfactory material. In the *Chemist and Druggist* of 15 March 1880, a Mr Piper published an interesting paper on the preparation of theriac. He quotes from another pamphlet, published in 1612, that relates how the master of the Grocers' Company, having noticed that a filthy and unwholesome composition was being brought into the realm as "Tryacle of Genoa" which was made only from rotten garble and refuse of all kinds of spices and drugs, reported this to the College of Physicians, and induced them to prescribe the proper formula and superintend its manufacture. This supervision was then entrusted to an apothecary who every year that he made the confection had to show the ingredients and the product to the College.

Thus it can be seen that in spite of the differences in preparing theriac between Britain and the Continent a parallel may be drawn between them. The quality of this medicine was important in both parts of Europe and regulations were issued in an attempt to guarantee it.

On the Continent and also in Britain, theriac was not exclusively sold by apothecaries. The drug was so popular

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that the travelling salesmen of medicines offered theriac as a powerful drug for almost any disease. Local government on the Continent tried to protect the citizens from buying unsatisfactory material, so quacks and other tradesmen were not allowed to sell their merchandise unless it was seen and approved by a panel of experts. It is probable that these salesmen, just like the apothecaries, after inspection exchanged the good theriac for a cheaper one, and it is true that they had a very good trick to make people believe that their product was effective. For this purpose the salesman usually carried a snake, and whilst singing the praises of his theriac, let it bite him. The curious crowd saw that the man survived, thanks, as he said to the theriac he was offering. In actual fact this bite was totally harmless. Shortly before the performance, the salesman had given his snake a large piece of flesh to bite so that its poison glands were empty and the next bite could do no harm to anyone.

How the fame of theriac ended.

In the middle of the eighteenth century serious doubts had arisen as to the value of viper flesh. Elzevier, the Dutch author, warned his readers not to buy viper cakes at a druggist's shop. These cakes are so old he said that they have lost all their power. At about the same time in Britain theriac's role was almost played out. In 1745 Dr William Heberden, a London physician, published a paper in which he completely condemned the theriac. In his opinion there was absolutely no foundation for the wonderful stories told concerning it and the most that could be said for it was that it was a diaphoretic, "which", he wrote, "is commonly the virtue of a medicine which has none."

Just at the time Dr Heberden's work was published a new edition of the *London Pharmacopoeia* was nearly ready for issue, and it was too late to make alterations. It was the last time theriac appeared in this publication. In the Netherlands however a formula for Theriaca Andromachi remained in the pharmacopoeia until the nineteenth century, although by the end of the eighteenth century it was already very much simplified. It is remarkable that in the *Amsterdam Pharmacopoeia* of 1795 the formula for theriac contains no viper flesh, but in the list of simples vipers still appear!

In the nineteenth century all that remained of theriaca were electuaries with a certain amount of opium. They too disappeared from the pharmacopoeias in the twentieth century, the century when doctors and pharmacists became familiar with exact doses of medicines.

But if you should think that there is no theriac left today, you would be wrong. This famous medicine is still in use. Ten years ago I was in Rome and visited the Pharmacia Santa Maria della Scala. In this modern pharmacy you could still buy theriac, and even the most famous of all, "Teriaca secondo la formula di Andromacho", that is, "Theriac according to Andromachus' formula". You needed no prescription to buy it, theriac had become an "over-the-counter" medicine. It was recommended for the diseases of our time, insomnia, nerves and digestive disorders.

So it may be concluded that at least in Italy, Venice Treacle has survived for two thousand years and is still a panacea, though if you take a closer look at the components of this theriac you will feel disappointed. There is nothing left of all the exotic ingredients that were displayed in former days. So as Charles LaWall wrote, "Sic transit gloria electuarii".

Useful Documents.

Once again The Royal Commission on Historical Manuscripts has kindly extracted a list of useful documents from their Major Accessions to Repositories in 1993 relating to pharmacy.

Thomas Farmer & Co.,chemical manufacturers, account book, letters and invoice, 1780-1812, are now in the Science Museum Library. (MSS 405, 1190)

The memorandum book, c.1762, of **John Brameld,** apothecary, is to be found in the same library. (MS 381)

St. Mary's Priory (Benedictine nunnery), Princethorpe. A medical guide and pharmacopoeia compiled for the nuns, 1836. Now at the Wellcome Institute for the History of Medicine. (MS 7028)

The following prescription books are to be found: **D.W.Turner,** chemists, Holsworthy, 1919-46, North Devon Record Office, (B.299); **Frank Pick,** chemists, Burnley, 1833-1915, Lancs. Record Office. (DDX 1101); **Liverpool chemists,** 20th. century, Liverpool Record Office and Local History Department.

The minute books, 1945-88, of the **Cardiff and District Pharmacists' Association,** Glamorgan Archive Service.(D/D PA/C)

Record books of **Caernarfon chemists, 1880-1970,** at Caernarfon Area Record Office. (XM 9193)

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MEDICINE FROM ANIMALS: from Mysticism to Science.

K.Holland.

The use of medicines derived from plants has long been studied as the many herbals and early pharmacopoeias testify. The choice of a vegetable-derived medicine was often based on the fanciful concept that the part used resembled the organ to be treated. Eyebright (*Euphrasia officinalis*) provides the classic example. In Roman times and for many centuries afterwards, its eye-like flowers were infused to make eye washes.

The use of drugs prepared from animal sources however was often founded on much more sinister considerations. Cannabalism has been practised throughout history. Logically its object was to gain protein when other sources failed. Less obviously logical was the ritual eating of certain parts of an enemy killed in battle; eat his heart and gain his courage, his brain and gain his cunning, and so on.

The large materia medica accumulated by the eighteenth century included many useful substances derived from animals such as lanolin or lard used as vehicles for topical medicaments. Less useful were the animal parts used with mineral and vegetable drugs to make the many varieties of theriac, claimed to be a universal antidote. One of the earliest known medical records, the *Ebers Papyrus*, refers to a number of recommended drugs from animal sources. Among these were blood, human brains, cats' genitals, animal oils, milk, eggs, wax and honey. The 1677 *Pharmacopoeia Londinensis* used by the Plough Court pharmacy in Sylvanus Bevan's time lists, the slough of a snake, dung of various animals, the fat of a man, horn of unicorn and moss growing on a human skull. According to Dr Richard Gordon, among the treatments to which the dying Charles II was subjected was a "spirituous draught of skull of a man meeting a violent death" which, Gordon added, was "the clinical equivalent of extreme unction". The same medical men plastered the royal feet with a mixture of pigeons' dung and tar.[1]

Honey seems to have been used throughout the ages, usually for sweetening but it had other uses too. A report in the Aesculapian temple records relates, "A blind soldier named Valerius Aper, having consulted the oracles, was directed to mix the blood of a white cock with honey and make of it an ointment which he was to rub on the eyes for three days. He recovered his sight and went to thank the gods before all the people."[2]

Many invertebrate animals provided a source of medicaments for mediaeval apothecaries and physicians. Earthworms (dried and powdered and used as an anthelmintic) and woodlice also figured in the Plough Court pharmacopoeia, but more useful were cochineal (*Dactylopius coccus*), cantharides (*Cantharis vesicatoria*) and the leech (*Hirudis medicinalis*) Almost certainly useless, and definitely unpleasant, were caterpillars, centipedes, cicadas, dung beetles, maggots, scorpions and spiders prepared in a number of ways for a variety of conditions from dysentery to smallpox and insanity. Probably equally useless but less unpleasant were powdered shells of sea molluscs, cuttlefish bone and corals.

Just about every part of every vertebrate has been used as a medicine at one time or another. The more outlandish the animal, the more people were impressed with its efficacy. The alligator, dried and usually suspended from the apothecary's ceiling, was particularly popular as a medical curiosity; apart from decoration, its use remains unclear.

Animal horns, usually powdered, were much used. The goat antelope (*Nemorhoedus crispus*) donated its antlers which were "used in coarse powder or partially calcined in cerebral affections and rheumatism and especially in diseases accompanying pregnancy. The shavings, said to be a cooling medicine, were supposed to cure inflammation of the lungs and liver."[3] Hartshorn (from deer's antlers) provided expensive medicines which were said to have valuable properties; Spirits of Hartshorn lived on in pharmacopoeias until recent times.

Rhinocerous horn was popular as a tonic and to reduce fevers, and is still used in China as an aphrodisiac, so causing the animal to be hunted almost to extinction. "Unicorn horn" was likewise commonly used in western medicine, as was ivory, powdered and used as a jelly in ricketts. However, it seems that the chief enemy of the African elephant today is not the apothecary but the carver.

Elephant hide, hedgehog skin and scales from the pangolin or scaly anteater were all used for skin diseases, presumably as unguents or as lotions. More unpleasant was the use of faeces from certain birds and mammals including man, human placentae and urine, as well as the contents of gall bladders. Musk from the musk deer (*Moschus moschiferus*) "was believed to purify the air, cure melancholy and protect from the bites of serpents."[4]

Unlike the discovery of useful medicaments following the study of the mode of action in some traditional vegetable preparations, those based on extracts of animal organs were not similarly related to the use of any animal derived medicines so far described. Probably the first such preparation to have a positive affect in disease prevention was the use by Jenner of the liquid from cowpox vesicles on James Phipps on 14 May 1796.

His discovery of vaccination was based not on fancy but on observation. Jenner's achievement was well received

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in the rest of Europe but typically in this country he lacked support from most of the British establishment and was the butt of cartoonists.

Vaccination did not progress further until three quarters of a century later when Louis Pasteur produced vaccines against anthrax and, even more importantly, against rabies in which he used the dried central nervous system of a rabid dog. The rabies virus produces its effects only some time after a bite from a rabid animal, so that the early injection of his vaccine was able to abort the progress of the disease.

When Lord Iver's gamekeeper was bitten by a rabid dog he had to be sent to the Pasteur Institute in Paris for treatment. Lord Iver felt that a similar establishment must be made available in England and generously funded its foundation. Opened in July 1891, it was named the Lister Institute after its first chairman.

For many years the Institute operated a vaccine and antitoxin production complex at Elstree. There large quantities of smallpox vaccine were prepared from sheep scarified with *vaccinia* virus. Made available for both home and export, millions of freeze dried doses were stored against an epidemic which thankfully never happened. Horses were kept also for the production of diptheria and tetanus antitoxins, later refined to remove allergenic proteins. The eradication of smallpox and the use of antibiotics led to the closing of the Elstree works. The Lister Institute of Preventive Medicine now operates from its Stanmore offices to fund U.K. medical research. Vaccine production and use is still one of our most powerful weapons against disease.

As important for its effect on medical research was an experiment conducted 93 years after Jenner's death. At the age of 72, Charles Edward Brown-Sequard injected himself with a testicular extract. He told a meeting of biologists in Paris that it had increased his appetite, physical strength, bowel function and mental ability. From the source of his preparation it became known in Britain as "monkey gland treatment" and led to much ribald comment. Nevertheless, this experiment did much to stimulate the development of "organo-therapy" and the subsequent discovery and use of hormones.

Brown-Sequard had previously investigated the action of the adrenal glands without much success, but the hunt for "chemical messengers" was in full cry. In 1890 two Portuguese surgeons imbedded pieces of a sheep's thyroid under the skin of a woman suffering from myxoedema and found her condition much improved. George Murray, a Newcastle physician, reasoned that the rapid improvement was due to the "juice" of the gland, and prepared injections from it which were equally effective.[5] The dried gland, administered by mouth, was also shown to be efficacious, and thyroid tablets appeared in the world's pharmacopoeias. Their potency was sometimes not very certain so that the introduction of synthetic thyroxine provided a marked improvement.

It was at about this time that the active principal of the medulla of the suprarenal gland was first isolated; separated out from extracts of the gland it was found to have a comparitively simple chemistry. In 1900 synthesis of adrenalin was achieved in both Germany and the USA by workers in the laboratories of Hoechst and Parke Davis. As a consequence extracts of suprarenal gland medulla tissue were never used in medicine, although an extract prepared from the cortex was made and sold by Organon in the 1930s. Isolation of cortisone and its preparation from sisal juice some twenty years later put an end to the use of the glands from slaughter houses.

The treatment of diabetes and pernicious anaemia.

On 11 January 1922, a seriously ill young diabetic, Leonard Thompson, received a dose of Banting and Best's extract of pancreas, a prelude to one of the greatest breakthroughs in medical science. Even today, 72 years later, large quantities of insulin are still prepared from animal pancreases collected from the world's abattoirs. It has been said that the increasing incidence of *diabetes mellitus* could soon overtake the available sources of supply, but the invention of "geneticly engineered human insulin" has probably solved this difficulty, although its use has not been problem free.

The difficulties of producing enough insulin to treat the world's diabetics were far beyond the capability of Toronto University's laboratories. In May 1922, Eli Lilly of Indianapolis were licensed to produce the hormone for the American continent. The early days of the following October found Banting as aware that his patients were as much in danger of an early death as they had been before his research, but by the end of that month Lilly had produced their first commercial batch under their tradename of "Iletin". The situation for the patients already on treatment was saved.

The logistical problems of gathering sufficient pancreases, storing and processing them before the hormone was destroyed were monumental. These difficulties nevertheless were satisfactorily solved by Lilly, and later by Schering in Germany, Organon in the Netherlands, and by April 1923 Allen and Hanbury, British Drug Houses, and Burroughs Wellcome in Britain were able to offer insulin approved by the Medical Research Council for clinical use; Boots Pure Drug Company came into production shortly afterwards.

During these years Dr William P.Murphy, at the suggestion of Dr George R. Minot investigated the use of

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raw liver in the treatment of pernicious anaemia. In 1928 Mrs Lily Lilly [sic], wife of J.K.Lilly senior, head of the firm of the same name, became a victim of this hitherto fatal disease. In an effort to find a more acceptable treatment than raw liver, he arranged for the Company's researchers to collaborate with Minot and Murphy to produce a marketable and palatable extract of liver. They were successful, and later Minot and Murphy shared the Nobel Prize with Dr George H. Whipple of Rochester University.

The discovery and production by fermentation of Cyancobalamin by Lester Smith working with Glaxo in the 1960s put an end to an unpleasant process for the factory workers as tons of animal livers and stomachs were delivered daily for processing.

Sex Hormone Discoveries.

The Dutch firm Organon, owned by the abattoir operators and meat processors, Zwanenberg N.V., was a pioneer in commercial endocrine gland extraction. Saal Zwanenberg, Organon's chairman, made the comment that, "God would not have created useless organs". In 1923, under the instruction of its medical consultant, Professor Ernst Laqueur, Organon had been the first European company to produce insulin. Two years later, they were the first in the world to market a sex hormone product, a somewhat impure extract of equine ovarian tissue branded "Menformin".

As demand increased other sources of oestrogen had to be found. Three alternative materials were used in turn, first, placentae, then the urine of pregnant women, and finally, in 1930, the urine of pregnant mares.

In 1930 Schering A.G. collaborated with the German chemist, Adolph Butenandt, to find the male sex hormone. From crude extracts of urine, (allegedly obtained from the Berlin police barracks) Butenandt extracted a white crystalline substance which he called Androsterone. Meanwhile in Holland, Laqueur had obtained extracts of bulls' testes which proved to be more active than Androsterone. From these extracts, the Hungarian Jewish chemist, K.G.David. prepared pure crystals of a very active male hormone which he christened Testosterone.

Butenandt had been working towards the synthesis of Androsterone but now switched his efforts to the new Testosterone. Simultaneously, he and Leopold Ruzicka who was working with CIBA's Albert Wettstein in Zurich, starting with cholesterol succeeded in synthesising the hormone. For their work on steroids Butenandt and Ruzicka were awarded Nobel prizes, although Butenandt was not permitted to collect his until after the war. Dr David fared less well - he perished in a German concentration camp in 1945.

Two German gynaecologists, Bernard Zondek and Selmar Ascheim, implanted a small piece of cow's pituitary gland into sexually immature mice. They noted the increase in ovarian size and hormone production so causing an enlargement of the uterus with subsequent development of oestrus. They described their work in a German medical periodical with the conclusion, "The anterior lobe of the pituitary is the motor of sexual function."[6] The bio-assay which bears their name was the first test devised for early pregnancy.

Foreseeing the importance of their discovery to pharmaceutical companies, Zondek chose the I.G.Farbenindustrie to extract and market the hormone from mammalian pituitary glands. This preparation was given the brand name of "Prolan". It was later shown to be composed of two hormones, both of which affected male and female gonads; they were then marketed separately as "Prolan A" and "Prolan B".

Later developments

The 1950s and 1960s saw the development of new synthetic steroids, and of more effective techniques of administration. Apart from heparin, some blood products and calcitonin obtained from salmon, new medicines, as well as old ones, are no longer manufactured from animal parts even though they may have been first extracted from them for experimental use. Nowadays relatively simple substances are synthesised in the classic manner, while those of more complex construction, such as proteins and polpeptides, are produced by genetic engineering.

Hirudin is a good example. To recover one dose large quantities of leeches would need to be sacrificed. Although this may appear just when one considers how much human blood has been fed to them in the past, their use as a source of the anti-coagulant is not practical. A DNA plasmid coding for hirudin is put into non-complaining E.coli which are grown in fermenters in a broth from which the desired substance can be harvested in a good state of purity. Many new chemical messengers and other substances in the mammalian body for which a medical use has been found are now prepared in a similar way.

Animal derived medicine research seems to have left Europe for the USA where the majority of molecular biological companies are concentrated. These firms are not in possession of marketing "know-how" so they sell their processes to the older pharmaceutical giants. Thus Schering, which is among the leaders in this sector of medicinal innovation, are soon to market interferon beta for use in the treatment of multiple schlerosis. Its production had been developed by an American biotech company which Schering bought to the considerable enrichment of the bio-company's directors.

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Although the results of modern pharmaceutical research are breathtaking, we must admire the genius of the workers of the last half of the nineteenth and early twentieth centuries. With optical microscopes, burettes and pipettes, and with Pregl's micro and semi-micro chemical methods available only towards the end of the period, these pioneers of medicines from animals worked out the chemistry of many basic life mechanisms.

They lacked the help that modern apparatus affords; sometimes weeks and sometimes months were needed to obtain results that today's workers achieve in minutes.

The use of the electron microscope, researches into the structure of proteins, and the understanding of the functions of cell structures did not begin until the 1950s. Only by painstaking research and brilliant deduction were these early workers able to develop a powerful armoury of animal derived pharmaceuticals and to lay the foundations for the spectacular advances of today.

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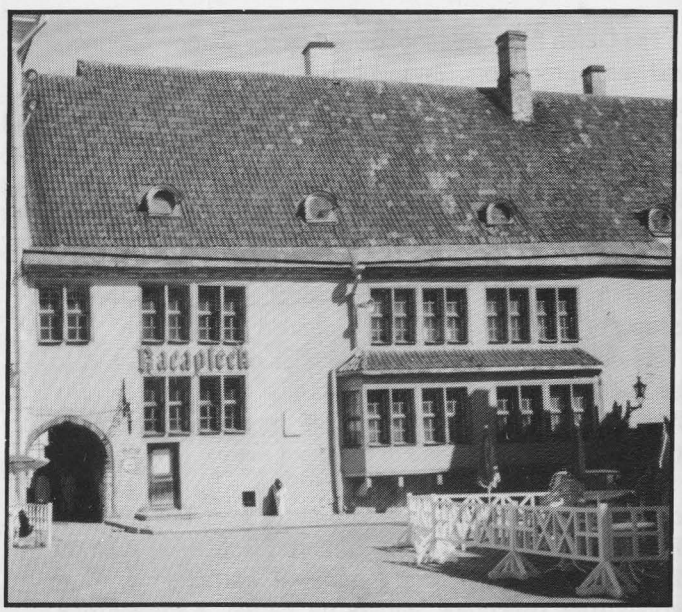
One of the oldest pharmacies in Europe.



The Raeapteek in the market square, Tallinn, Estonia, is claimed to have been in continuous operation since 1422 until very recently. Like many buildings in Tallinn it is now being renovated.

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Contents.

Diary Dates.

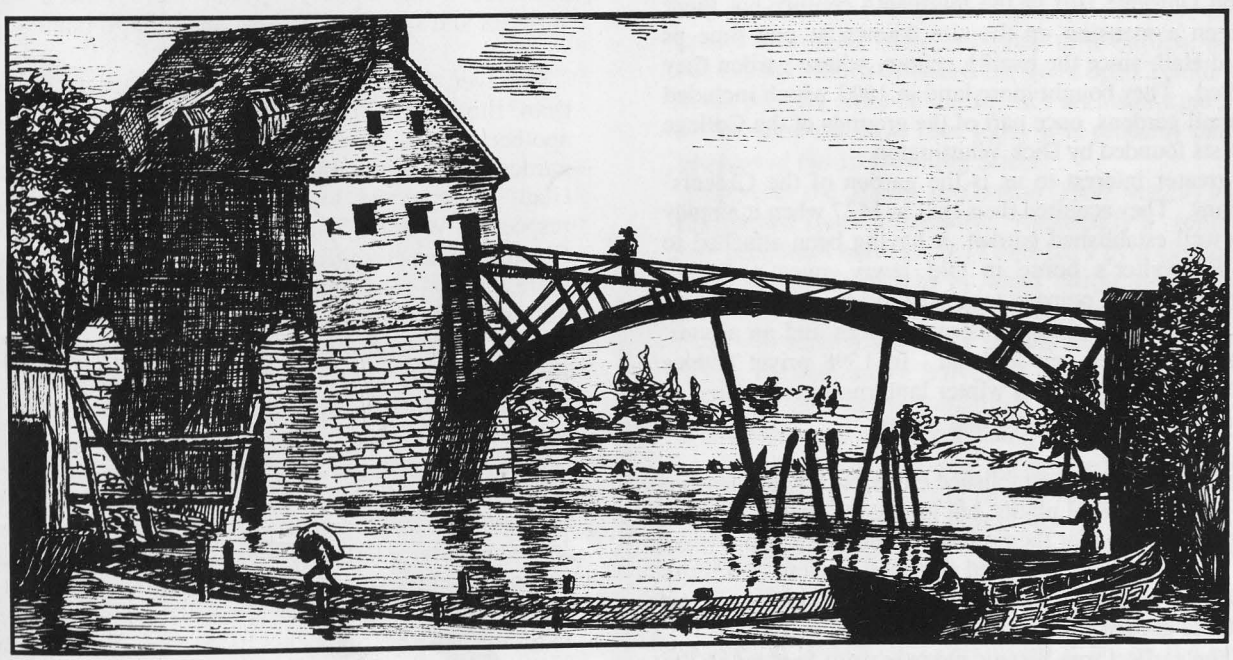
Wednesday, 8 March 1995.
The Foundation Lecture.
"Pills and Profits."
Dr. Tilli Tansey of the Wellcome Institute for the History of Medicine.
Admission by Ticket only, supplied free by the Royal Pharmaceutical Society of Great Britain, Lambeth.

Obituary.

Mr A. Wright, FRPharmS.

Members of BSHP will be saddened to hear of the death of Mr. Arthur Wright on 18 July 1994 after a long illness. From May 1973 to June 1991 Arthur was editor of the *Pharmaceutical Historian* bringing with him all his editorial experience gained at the *Chemist and Druggist.*

He and his wife Ina were indefatigable supporters of BSHP and no meeting or conference seemed complete without them. We will miss Arthur and only hope that Ina will soon feel able to join us again.



The old mill at Noisiel near Paris used by the pharmacist J-A-B Menier for the manufacture of chocolate and pharmaceutical powders in 1825

1848

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SOME EARLY LONDON PHYSIC GARDENS.

Dr J. Burnby.

In the Middle Ages in Britain the art of gardening was largely restricted to the homes and castles of the great, and to the herb gardens of the monasteries. There were for example two famous gardens to be found in Holborn, that of the Bishop of Ely renowned for its strawberries and roses, and that of the Earl of Lincoln.[1] All the Friars, whether Grey, Black, White or Augustinian had gardens within the precincts of their friaries, whilst Westminster Abbey had a veritable collection of gardens. That which is known as the College Garden was formerly the herb garden of the infirmary, and west of the infirmary was the "Grete" garden. The abbott had his own near to the Sanctuary building within the north west corner of the old wall, whilst the cellarer had a large garden in what is now called Covent Garden.

Many of the London livery companies had gardens and in some cases their origins may be traced back to the thirteenth and fourteenth centuries. Amongst many other acquisitions, Thomas Cromwell purchased the garden of the Austin Friars in 1534 which in due course was to become that of the Drapers' Company. In 1611, the Stationers' Company purchased Abergavenny House situated just within the City walls to the north of St. Martin, Ludgate. When taken over the premises would certainly have included a garden similar, if rather smaller, to other town houses of the nobility. The Skinners' obtained their Hall on Dowgate Hill in the fourteenth century but there had been a mansion on the site, known at one time as Copped Hall, since the twelfth century whose garden they inherited. They bought more land in 1602 which included two small gardens, once part of the grounds of the College of Priests founded by Dick Whittington.

Of greater interest to us is the garden of the Grocers' Company. They acquired their Hall in 1427 when it already had a well established garden, it having been attached to Lord Fitzwalter's house in Old Jewry, once a Jewish synagogue. The Company took great pride in their garden. They planted new vines, constructed steps and an arbour, and a herb garden was laid out. In 1598 privet hedges replaced old railings, and winter lanterns were ordered to provide lighting for the bowling green.[2]

These gardens were established either purely for pleasure or to grow medicinal plants, but gradually interest grew in the study of plants for themselves, although for many years their use as simples remained the chief reason. To those places where this serious study took place, the name physic or botanic garden was given.

The earliest true botanic gardens were founded in the university cities of Italy. There has been controversy as to whether the honour of being the first should be awarded to Pisa or to Padua. The latter city was already famous for its university, particularly for its medical school, when Bonafede in 1543 put forward the idea that the university should provide an area in which plants would be specially cultivated for study purposes. It was a period of great maritime exploration, with plants hitherto unknown to Europe arriving in increasing numbers, so that a special feature became the growth and study of these rarities.

The idea was taken up with enthusiasm, and other cities quickly followed suit - Pisa, more or less contemporaneously with Padua, Bologna in 1567 where the project was initiated by the great Ulisse Aldrovandi, Florence in 1545 and Rome about 1577. The first in northern Europe was established at Leiden in the Netherlands by 1577. Montpellier in 1596 beat Paris's Jardin des Plantes by a year. Montpellier's botanic garden mainly came about because Pierre de Belleval discovered that his students were leaving in order to attend those Italian universities which had gardens where living plants could be studied.

As might be guessed Britain was well behind in these stakes, for it was not until St. James' Day 1621 before Oxford University's Botanic Garden, the first in Britain, was opened with much pomp and ceremony. It had been founded by Henry, Lord Danvers, one-time page to Sir Philip Sidney, as he desired to be instrumental in the setting up of "a place whereby learning, especially the faculty of medicine, might be improved." It seems to have been twenty years before the first curator was appointed. This was Jacob Bobart who had earlier come from Brunswick, a fine gardener but undeniably odd. Of swarthy complexion with a long black beard which on high days and holidays he tagged with silver, he was accompanied on his walks, not by a dog, but by a goat. By 1648 he had produced a catalogue in which there were some 1600 varieties and species of British and foreign plants.

However, there were other botanic gardens in England than those of a university. A growing number of apothecaries in London had had for many years physic gardens of considerable repute. The Royal apothecaries, Hugh Morgan and John Rich, are both spoken of with respect by William Turner,M.D., Matthias de l'Obel and Clusius. Turner said of Rich's garden that he had seen there, "many good and strange herbes which I never saw anywhere elles in all England." Hugh Morgan was in contact with Continental apothecaries such as Jacques Farges of Montpellier, and Pieter Coudenberg and Wilhelm Driesch of Antwerp with whom he exchanged seeds and specimens.

There were too the lay persons such as Richard Garth, (died 1597) Principal Secretary to the Chancery, friend of Clusius, who had a garden at Morden, Surrey, and another in Hampshire. Another with two gardens was Hugh Plat, inventor and writer, who established one at Bethnal Green and another in St Martin's Lane. Nor should be forgotten William Coys of Stubbers, Essex who flowered the first Yucca plant in this country, and of course the famous John Tradescants, father and son.

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Specialisation in certain flowers began towards the end of Elizabeth's reign. The famous Ralph Tuggie of Westminster specialised in the Dianthus family or "Gillofloures"; many esteemed specimens were named after him, "Master Tuggie's Princess" or "Master Tuggie his Rose Gilliflower" (Rose meaning double.) He was also famed for his auriculas. [3] The most famous of all Auriculas was perhaps that named "Mistress Buggs her fine purple." It is tempting to believe that she was the wife of John Buggs, apothecary, later turned physician, who was one of Thomas Johnson's companions on his first herbarizing excursion into Kent. (13-17 July 1629).[4]

Finally, we must not forget John Gerard, barber surgeon. (1545-1612) and John Parkinson, apothecary, (1567-1650). About 1577 Gerard became supervisor of Lord Burleigh's gardens in the Strand, London, and at Theobalds, Hertfordshire. In 1596 he published and dedicated to the Lord Treasurer his *Catalogus,* the first complete catalogue of any garden, public or private, in which he listed over a thousand varieties of plants growing in his own garden in Holborn. There has been considerable debate as to the exact site of this garden, but almost certainly it was on the south side of Holborn to the west and south of Barnards Inn.[4] On 12 July 1587, the College of Physicians decided to rent from Lord Sackville a garden at £26 13s.4d. a year, and on the following 6th October engaged John Gerard as curator; he was particularly required to stock it with the rarer plants.

John Gerard pressed the Company of Barber Surgeons to provide a physic garden for its members so that they would come to know the herbs they used. When he was on the Court of Assistants in 1595, Gerard submitted a scheme for such a garden, suggesting that land belonging to the Company near the Tower should be used. This land was not deemed suitable, but nevertheless the Company did not appear averse to the idea and it was discussed again in 1596 and 1597 although without positive result.[5]

We know that John Parkinson, charter member of the Society of Apothecaries, had his garden in Long Acre as early as 1607 because he paid Wilhelm Boel of Friesland to supply him with seeds and roots gathered on his trading trips to the western Mediterranean. [6] He published his *Paradisi in sole Paradisus terrestris* in 1629, the first English book on gardening, a subject which has since proved enormously popular as any visit to a library will testify. Nearly a thousand plants were described and illustrated, and on the strength of it Charles I gave him the title of *Botanicus Regius Primarius.* This gave him the right to more or less explore the royal gardens at will and his later book *Theatrum Botanicum* (1640) not infrequently mentions, for example, the Privy Garden in Whitehall.

There is an interesting entry in the State Papers Domestic for September 1660, entitled, "The humble petition of John Chase, his Majesty's Apothecary" [which]" sheweth that John Parkinson, Botanick to your Majesty's father had by his favour a grant of a small parcel of land next to the Tennis Court in St. Jameses Fields to make thereof a garden of plants for his Majesty's use and delight, towards the inclosing of which with a wall, erecting thereon a small garden house of two rooms and furnishing it with plants your petitioner's father [Stephen Chase, apothecary to Charles II when he was prince] was out £200, upon the condition of having your petitioner joined with Parkinson in a grant for a longer time of years promised to him by your royal father but the commencing of these disruptions and the death of Parkinson hath prevented the performing of that grant". So now John Chase was requesting a lease of 31 years of that piece of land at 20s. a year so that he would be "encouraged to expend what is fitting to make it convenient for your Majesty's use and delight." We can be certain that this petition was ignored.[7]

Less than a year later Sir Arthur Slingsby on 30 May 1661 also put in a bid to the Surveyor General of Crown lands in which he claims that he has purchased "a lease of a piece of land in St. James' Field commonly called the Physick Garden. 100 feet by 180 feet at 40s a year rent", on which he designed to build a house. He wanted the lease extending to sixty years. He too was wasting his time.[8]

The question was could one locate this physic garden rather more exactly ? Somewhat surprisingly in 1634 there were in the area of Whitehall three tennis courts, and until shortly before that date, four, two open and two enclosed. One was on the south side of the Cockpit passage off King Street, the main thoroughfare of Whitehall, another, the one originally erected by Henry VIII, ran parallel with the same street, a third was next the Tilt-Yard, and the fourth "nexte the Park", that is St. James' Park. In 1662, Thomas Cook, Master of the Tennis Courts, was told by Charles II to make a new court on, "that parcel of ground lately converted to a Garden, adjoining the Cockpit formerly called the great open Tennis Court." This, one felt, must be the site of Parkinson's garden, and if that were the case, then today it is probably part of the gardens of No.10 Downing Street.

However the *Survey of London* (1960, vol.29) identifies the garden quite differently. Apparently a tennis court had been built between 1617 and 1619 by a Gedeon Lozer at the corner formed by St James' Street and the old high road running westwards from the Haymarket which in 1661 was superseded by the present day Pall Mall.

The Parliamentary Survey of 1650 shows that on the west side of what is sometimes called St. James' Field, and sometimes, more accurately Pall Mall Field, was a new house with a garden surrounded by a high brick wall, "plentifully planted w[i]th various & rare plants, flowers & rootes, Wall fruite, cherrie tree & vine trees, very pleasant to the eye, & profitable for use." [9] The *Survey of London* then went on to to say that this garden later became known as the Physic Garden and had been planted by James (sic) Parkinson; it lay on the east side of St. James' Street and to the north of the tennis court.

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In 1651 the Deputy Keeper of St. James' Palace, Hugh Woodward, bought Pall Mall Field from the trustees for the sale of the late king's lands and proceeded to build on part of it. Other speculators joined in, including one, be it noted, called Daniel Charlewood. After the Restoration, some tenants compounded for their property with Henrietta Maria's trustees and obtained new leases. The Morden and Lea map of 1681 shows the area as being built over.

We now have to leave the well known figures of Gerard and Parkinson and turn to a man who has received little attention from historians. William Gape on 1 March 1633, the son of Hugh a clothier in Dorchester, Dorset, was bound for eight years from Lady Day to William Bell, like Parkinson a charter member of the London Society of Apothecaries, and a future Master.[10] It is interesting to note that a rather earlier apprentice of Bell's was Thomas Johnson, the "emaculator" of Gerard's *Herbal*. Gape was freed on 15 August 1642 at Apothecaries' Hall and was always much involved in the activities of the Society.

The Covent Garden Records show that he held a lease in this new development in 1651, and it is known that he held another lease in 1656 near the old Pell Mell Alley.[11] Like his fellow apprentice, Thomas Johnson who had died in the Civil War, Gape was a Royalist. In May 1660 the Company of Apothecaries were expected to receive King Charles II when he passed through the City "with the greatest demonstracon ... of heartie affecons and joy for his Majesty's happie retorne", but there was no compulsion brought upon the Society's members. The roll of membership was called and William Gape was amongst "the fifteen first consenters to ride" in what they called the "equipage". [12]

On 9 August 1664 it was ordered in the Society's minutes, "in regard of many of the Assistants are not able to appeare att Courts: Mr Hinton, Mr Pilkinton, Mr Browne and Mr Gape bee chosen assistants. Mr Pilkinton desire that place may bee given to Mr Gape in regard hee is the Dukes Apothecarie. The Court give him thanks but will not meddle w[i]th it." [13] Mr Gape was sworn in as an Assistant. No reason is given for the poor attendance of the Assistants at the courts but one can not but wonder whether the terrible outbreak of plague in London had not already begun. The contemporary writer of *Lomoigraphia*, the apothecary William Boghurst says that he was in practice against the illness from 7 November 1664 to the end of May 1666.

The Restoration of the monarchy which had been entered into with such joy and high hopes of a less narrow minded and authoritarian regime very quickly saw two major disasters in the capital. The Great Plague as already mentioned, and the Great Fire in which 5/6ths. of the City was razed to the ground. The plague had barely died away when during the night of the 1st September 1666 a baker in Pudding Lane carelessly allowed his oven to over-heat and set fire to his stored brushwood. Dr William Denton, physician and friend of the Verney family, wrote not long afterwards, "More than the whole City is in ashes, wherein W.Gape and myself have great shares in Sythe Lane and Salisbury Court...and to render our condition more deplorable the depopulation is so vast that it cannot afford us a livelihood, so that I want advice of all my friends...." He went on to say that the City was now a desert so that the physicians who practised there were flocking westwards, so much so that he feared they would be reduced to bleeding one another.[14]

Gape rose quickly amongst the ranks of the Assistants, possibly because so many died during the plague period, men such as Benjamin Bannister, Master from 1663 to 1664, Henry Best, apothecary to the Charterhouse, Thomas Laxton, Upper Warden in 1664, John Rhetorick, Michael Markland. On 17 August 1671 Gape was elected Renter Warden. However the court minutes relate, "Mr Gape desires to be excused for that he can[n]ot serve because he is in attendance att [the royal] Court: This Court doth excuse him & acquaint him that the usuall fyne is £15 [and] leaves it to him himselfe, he sayth [he] will doe as otheres have done." Mr Butler was elected in his place.[15] From this entry and that of 1664 we can guess that Gape was apothecary to James, Duke of York, later to be the unsatisfactory James II. This is all the more likely to be the case when one remembers that James St. Amand, Gape's apprentice from 1660 to 1668, also became the Duke's apothecary and was almost present at the controversial birth of the future Old Pretender in 1688.

A year later the same problem does not seem to have worried Gape as on 15 August he was duly elected Master out of five contenders, although there seems to have been some problem with Mr Hinton who was Upper Warden. William Gape could well be described as a dynamic Master. At his very first Court held on 10 October 1672, the minutes tell us it was, "Noted that there bee an order drawne up that each apprentice that is bound shall contribute 2s.6d. for the Carying on of an Annual herbarizinge." On the 22nd October, "It was ordered that the Garden bee enclosed w[i]th out delay and then the master and Mr Johnson proceed to Gardening, or Mr Litlar". This must refer to a piece of ground within the Hall which was to be made into a garden as was so commonly found in other livery companies. These entries certainly show where the new Master's interest lay.

Like its Master, the Apothecaries' Society had suffered badly in the Fire of London, and was now re-building its Hall. Accordingly its finances were in a parlous state and the account books show that in 1671 Mr Gape not only lent the Company £100 but that the year before he had contributed £30 to the re-building fund. He now activated the collection of money for the wainscotting of the Hall, and then on 29 January 1673 an important decision was taken, namely that the Company was to have its own barge. (f.169v) It was pointed out that its use would not be confined to Lord Mayor's Day, but that it could also be

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very useful on herbarizing days. A committe was formed to find a convenient place for the barge-house, and here they ran into difficulties. Nevertheless it was reported on 22 July (f.176r) that the contract for the barge had been placed although a no more convenient place than Chelsea had been found for the barge-house. And thus began, all unknown to its members, but one wonders if it was to its Master, the Apothecaries' Physic Garden.

On 9 October 1673, having just handed over the Mastership, Gape promised to give £50 "towards the charge of the walling in the Grounds att Chelsey taken for a Garden in Case the Company will wall in the same within five yeares". Nothing happened for about eighteen months, then on 21 January 1675 a group of apothecaries were deputed to gather in as many subscriptions as they could towards the building of a "breicke wall about the Ground at Chelsey". Including Gape's gift this amounted to £286 5s 0d. The cost of the wall and other charges such as surveying and laying a pipe came to £412 6s.6d., so that £150 had had to be borrowed.[16]

On his next to last appearance at the Apothecaries' Court, that of 18 May 1675, Gape proposed to give 20s. towards the costs of one day's herborizing that summer. Not to be outdone, his old rival Anthony Hinton did likewise, as did John Chase. Gape made his will on the 3rd October of that year and was buried only six days later in the porch of St Paul's Church, Covent Garden, so joining his only son William who had been interred there two years earlier. His wife Mary followed him within six years.

In his will he described himself as of St Paul's, Covent Garden but he held property elsewhere, such as five newly erected houses in St. Sithins (sic) Lane and tenements in Dorset Court and Hanging Sword Court near Fleet Street. But most interesting to us is the following bequest to his wife, "That new erected House in the Pell Mell for the remainder of the lease I have of it". If she died before the lease expired then it was to pass to Elizabeth Gape daughter of his brother Thomas.[17] The position of this house must have been very convenient when he was attending the royal court and the Duke of York, and it is very tempting to believe that Gape was one of the speculators of Pall Mall Field and furthermore that he had inherited, so to speak, the garden that John Parkinson designed for Charles I. The idea is all the more promising when we remember that one of the major speculators of that area was Daniel Charlewood and that on 7 May 1672 a Benjamin Charlewood was bound to Gape for eight years.[18]

The Apothecaries' Society Court Minutes can tell us more about the subsequent history of this garden. On 13 June 1676 the clerk wrote, "The Master [who was Anthony Hinton] reports what he had done w[i]th Mrs Gape, Dr Denton and Mr Morgan about the plants in Mrs Gapes Garden and it is offered that if the Company will pay Mr Bayles £16 they shall enjoy the plants and garden for a year and three quarters from Midsomer day next and Mr Morgan leaves himselfe to the Compa[ny] touchinge his interest. Ordered: that the £16 be paid Mr Bales [sic] and take a lease for a year and three quarters from him of the said Garden ending att Lady day next come twelve months whereby they may have tyme to take of the plants and transplant them into the Compa[ny] Garden". Whereupon they paid Mr Bales immediately that day.

This entry has caused considerable comment and speculation, such as were the gardens of William Gape and Edward Morgan one and the same ?

The next minute referring to the garden, that of 7 November 1677, does nothing to clarify matters. "Mr Morgan the Gardiner was here and Desired the Courte would consider him for keeping the Garden and for his plants; the Court caused the former order of the 13th. June 1666 to be read." This was an error on the part of the clerk. There was no meeting or minute of that date. What he should have written was 13 June 1676 which is the one we have just examined. In other words, Edward Morgan was applying for a post at Chelsea.

A week later, on 15 November, the Court was still discussing the problems of the garden. Mr Phelps said, "Itt is better to reare new plants in their owne garden then to medle with Morgans plants and mainteine him being past his Labour." Whilst Mr Johnson and Mr Chase were even blunter, "The plaints are nott worth the £16 the Compa[ny] hath paid and Morgan pretends that they are his and will be a burden." So they ordered that a catalogue of the plants was to be brought in by Mr Morgan to the next Court. At the same time they formed a Garden Committee which was given full powers.

The truth of the matter was that Mr Piggott, the Society's gardener at Chelsea, was proving expensive, dishonest and incompetent, and Edward Morgan knew of this. Morgan was far more than a mere gardener but rather a man of considerable botanical knowledge. Dr Robert Morison, Superintendent of the Royal gardens, and so Morgan's near neighbour at Westminster thought very highly of "Ned Morgan" and his collection of plants. References to his garden are frequent amongst the writings of the seventeenth century botanists, but about the man himself we know very little. We do not know where or when he was born or died, except that in both cases it was almost certainly North Wales.

The first time he comes to our notice is when he acted as interpreter to the apothecary Thomas Johnson, Paul Sone and the Reverend Walter Stonehouse on their trip to north and central Wales in 1639. Johnson wrote that he was well versed in plant lore.

We next hear of him via William Howe, ex Royalist officer who abandoned the King's cause as its fortunes declined and returned to the study of medicine at Oxford. He published his *Phytologia Britannica* in 1650 and on the inside cover of his own copy are manuscript notes which show that he was not only acquainted with Morgan but also sought his advice.

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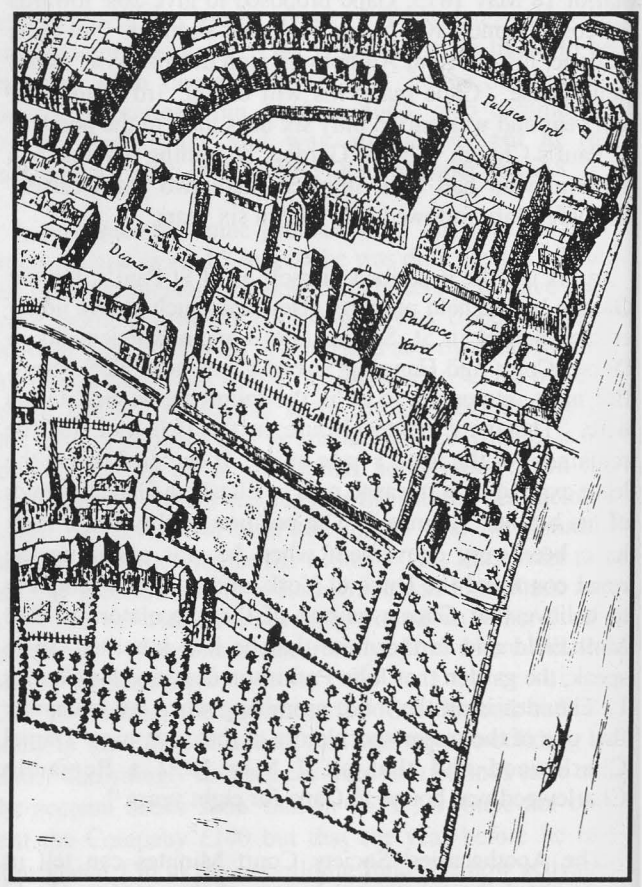
Five years later when writing to Sir Thomas Browne at Norwich, Howe outlined his idea of preparing a catalogue of the plants at the "Westminster Garden for horticulture, medicine and perfumery". That Howe had some connection with this garden is apparent from two books written by William Coles, his *The Art of Simpling* published the year in which Howe died, and his *Adam in Eden* (1657). The preface of the first book describes Howe as "one of the Masters" of the physic garden, and Morgan as "Gardiner". The "Approbation" to the second book is signed by Thomas Gillbank, Richard Tuggey and Edward Morgan, "Herbarist to the Physick Garden of Westminster".

The Physic Garden continued long after Howe's death. John Evelyn visited it in June 1658, John Ward many times between 1661 and 1666, John Ray in 1662 and 1668, and Leonard Plukenet was a frequent visitor. Christopher Merrett, friend turned enemy of the apothecaries, in his *Pinex* refers to Morgan and the Westminster garden, but gives much more hearty acknowledgment to the ex-Cromwellian soldier, Thomas Willisel, who was in his employ.[19] Thomas Lawson, Quaker, schoolmaster and botanist, visited Morgan's garden four times in 1677 and recorded nearly five hundred of the plants he found there.

By December 1677 the Apothecaries' Society's gardener, Mr Piggott had been dismissed and in his place Richard Pratt was installed on 29 January 1678 at £30 a year plus lodging. On the 24th. April Morgan once more appeared on the scene at Apothecaries' Hall. "The business of the £16 that was paid for Morgan's Garden" [the clerk thereby causing even more confusion in the future] "was Debated and the Courte Desired the Clerke Mr Meres to goe to him and see if hee cann p[re]vaile with him to pay the money or to gett plaintes in leiu of itt." In other words the Society intended to charge Morgan £16 rent for Mr Gape's garden which he had been using "for free" during the last year and three quarters. As John Meres was later to prove a notably successful negotiator there is little doubt the Society obtained satisfaction. Edward Morgan is not heard of again until 1680 when he was working at Bodysgallen, Aberconway in the garden of Robert Wynn with whom he and Johnson had stayed in 1639.

The Westminster Garden was still in existence in June 1692 when the Sessions Book records giving a receipt for 5s. paid into Court by, "Robert Rusholme of the Physic Garden, in the parish of St. Margaret's, Westminster, for refusing to take the Oath of Fidelity; he was a "reputed papist".[20] About 1687 Rusholme had begun to sell off the garden's rare plants and also sold an ale made from the roots of "*Meum Athamanticum*"[21]

The site of this much visited garden was certainly some distance from William Gape's. James Petiver wrote on one of his label's, "This grew many years ago in old Mr Edw. Morgan's most famous garden behind the Abby wall at Westminster." Jeffers believed from this that the garden must have lain within the precincts but Dr Richard Mortimer,archivist of Westminster Abbey, states the garden was never on Abbey ground. Plukenet writes about Morgan growing a tree for many years in his physic garden at Westminster at the back of (or behind) the Abbey, whilst Morison says the garden was at the back of (or behind) the west cloister.[22] The words "behind" or "back of" are dependent upon the direction from which you approach a place. All three men came from north of the Abbey, Morison from near where Buckingham Palace is today, Petiver from the City, and Plukenet from Old Palace Yard. Until further research is done, the best guess is that the garden lay on the southern side of College Street where there was ample water from one of the branches of the Tyburn. The map of 1658 shows gardens both east and west of Bowling Alley Lane which runs out of Deanes Yard and the West Cloister, but by the 1682 map the gardens on the east side are the only ones still existing. So the chances are high that this is where Edward Morgan's garden lay.



Faithorne and Newcourt map of 1658 showing area to the south of Westminster Abbey and Dean's Yard

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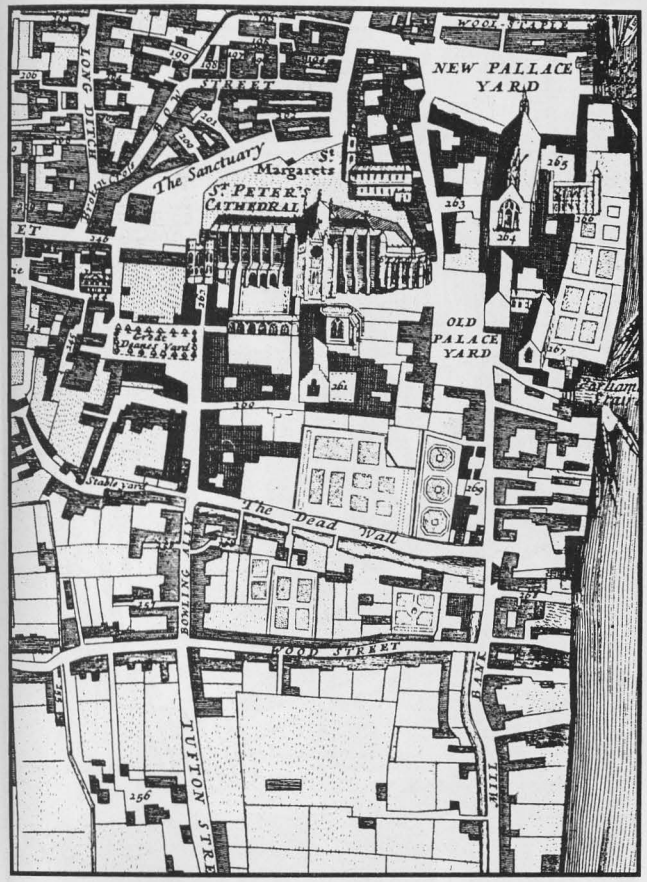

Morden and Lea map of 1682 showing building development to the south of the Abbey

Conclusions.

As Morgan's physic garden existed for ten or more years after the first discussions with the Apothecaries' Society we can dismiss the idea that Chelsea Physic Garden was stocked from it. There is however no doubt that the Society purchased both the lease and the plants of its late Master, William Gape. The common factor in the records which has caused so much confusion is Edward Morgan. We have no idea how Morgan's garden was financed, but it is unlikely that the Welshman was solely responsible. It is probable that Morgan realised by the 1670s that his garden was doomed because of pressure from new building developments, hence his application in 1677 for the post at Chelsea.

It has been suggested he may have been employed in a consultative capacity when the question of Mrs Gape's garden occurred, but this is unlikely as the apothecaries would have been perfectly capable of assessing the value of the plants. It is more likely that Morgan was already working part-time in Gape's garden - Gape undoubtedly employed one or two gardeners - and even had transferred some of his own plants to the garden, thus accounting for his reference to "my plants". We do, after all, have evidence that John Watt was growing some of his own plants in the Chelsea garden before he took over the direction of it.[23]

In the meantime the situation at Chelsea was improving. Richard Pratt had gone ahead with the work with vigour, and though he cost the Company more money than Piggott had done, there was now something to show for it. The most interesting entry in the Account Book is that on 7 September 1678 he was paid, "more by order to beare his charges to Oxford". From which we can guess that he had been to see the physic garden there and probably to seek advice too. In October the two wardens, Mr Phelps and Mr Clerke, with Mr Johnson and Richard Pratt were busy choosing fruit trees, in particular from a Mr Marshfeild; "nectorines of all sortes, Peaches, Apricokes, cherryes and plumes of several sorts of the best to be gott" are mentioned. More fruit trees were bought from Mr Marshfeild in January 1679 and yet more from a Mr Yorke in August. Indeed one would have thought the Society was intent on planting an orchard rather than a physic garden. For that we have to wait until the appointment of John Watt in 1680.

Notes and References.

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6. C.E.Raven, *English Naturalists from Neckham to Ray*, C.U.P.,1947, p.243.
7. P.R.O.,State Papers (Domestic), MS. 29/17,f.23
8. Cal. Treasury Books, 168l-5,Pt.3,p.1574, quoting from Stowe MS.498,p.134.
9. P.R.O., MS. E.317/Midd.71.
10. Guildhall Lib., Apoths' Court Minutes, MS.8200/1,f.311r. Bell appears on the 1641 Poll List as being of Westminster, and was in fact Member of Parliament for Westminster from 1640 to 1648.
11. G.L.R.O., Cov. Gdn. Recs.,MS. E/BER/CG/L 130/1a, 10 Dec.1651, The Earl of Bedford leased to William Gape for 7 years at £70 a year,"That messuage in the Piazza, being a corner house abutting south on Russell Street", a stable and coach-house with loft and room over, also the use of the Portico Walk and the well there. There is a full inventory from which we learn the house was four storeys high.

    I am indebted to the late Mrs Audrey Robinson of Enfield and Mrs Elisabeth Hall of Rochester for these two pieces of information.
12. Apoths' Court Mins.,MS. 8200/2, f. 21
13. Ibid., MS 8200/2,f.92r.
14. J.Bedford, *London's Burning*, p.226.
15. Apoths' Court Mins.,MS. 8200/2,f.151
16. Guildhall Lib.,Apoth.Soc.Account Bks., MS. 8202/2, not pag.
17. P.R.O.,P.C.C., Prob.11 348-99., Oct.1675. The executors of his will, besides his wife, were Alexander Denton Esq. of the Middle Temple, no doubt related to Dr Denton the physician, who bewailed their lot after the Fire, and his cousin Francis Bostock Fuller Esq.of the Inner Temple.

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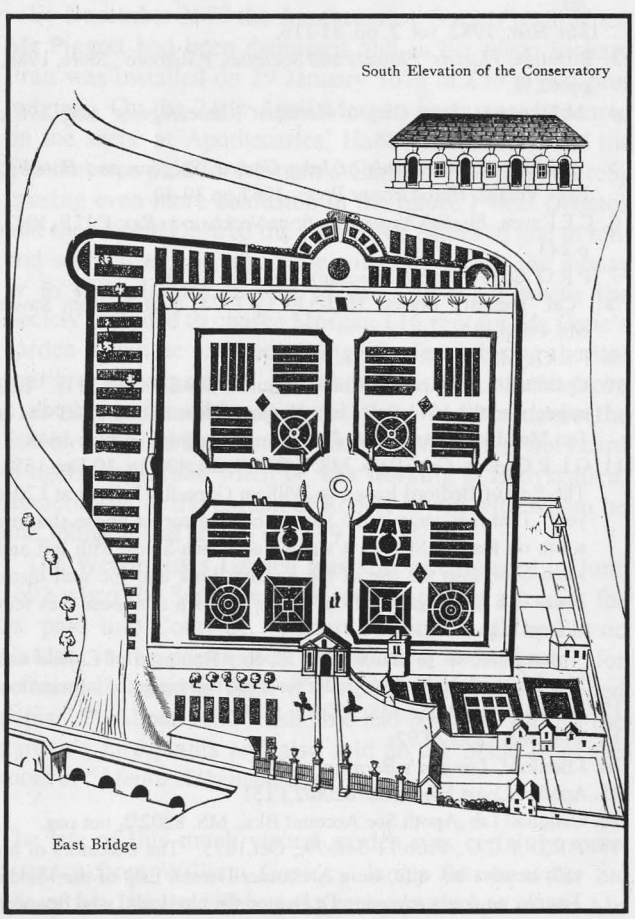
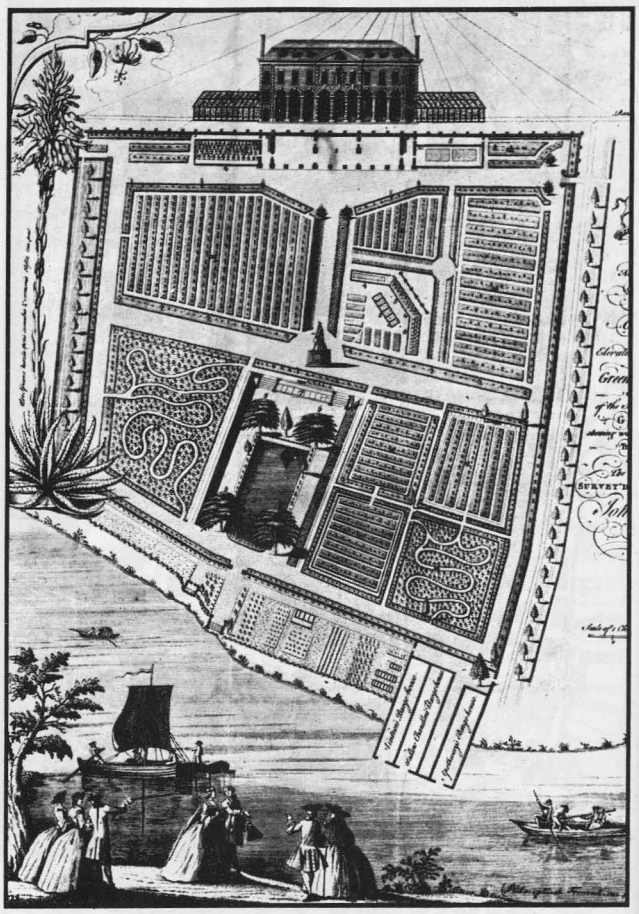
18. William Gape is known to have had at least three apprentices, James St. Amand, John Robinson and Benjamin Charlewood. Benjamin was bequeathed "£30 to place him with another master it being part of the money I received with him."
19. The apothecaries were at this period showing a very keen interest in botany, Peter Culley in his will dated 29 January 1666 gave "Mr Rickett of Hogsden, Mr Edward Morgan of the Phisick Garden at Westminster, and to Mr Richard [sic] Willisall, herbarist," 10s. each for rings, as he did to" Mr Jacob Bobert, senior,Master of the Phisick garden in Oxford", and Mr Robert Loggins, apothecary. Loggins was in 1671 a benefactor to the Society to the tune of £50. Forty shillings of the interest accruing was be given to four of the ablest herbalists of the Company, and the residue to four others who attended the General Herbarizing. In fact the money was used to offset the cost of the herbarizings. William Howe in his *Phytologia* notes that he had a few plants from "Mr Loggins".
20. W.J.Hardy, *Calendar of Sessions Books, 1689-1709,* 1905, Middx. Co.Recs.,p.43.
21. Britten & Dandy, *The Sloane Herbarium*, London,1958, Brit. Mus.,p.168.
22. Leonard Plukenet and Robert Morison wrote in Latin which Dr Christine Hillam kindly translated for me. The phrases used were "*pone Abbatium*" and "*pone coenobium occidentale*" which she tells me may equally well mean "behind" and "at the back of".
23. J.Burnby, "The Career of John Watts", *Pharm. Hist.*,March 1991, vol.21, p.4.
24. Apoth. Soc. Account Books, MS. 8202/2, not pag.



Plan of Oxford Physic Garden in 1675 showing the lay-out



Chelsea Physic Garden as laid out in 1751

News from America.

David Cohen writes to us, "My biographical writings continue - a few more have been added for a total of nineteen. If I am asked to do more, I shall, for each is a nice bit of work and I am kept with something to do that is not too demanding. My putative 85th birthday is Monday; my legal date of birth is 1 September. I celebrate both days." Well done David but how did this unusual state of affairs come about?

A clipping from the *Wisconsin State Journal* has been sent to us by Glenn Sonnedecker which relates that the State of Wisconsin produces 95% of Ginseng grown in the USA. Last year, 1.6 million lbs of dried and powdered root was exported to China and other Asian countries. Much increased production in Canada however is threatening profitability.

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GEORGE EDWARD TREASE (1902-1986) - A MAN OF HIS TIME.

Dr William E.Court.

Formal college education of pharmacy students is a relatively late starter in Britain. Prior to the foundation of the Royal Pharmaceutical Society of Great Britain in 1841 there had been no nationally organised schemes of pharmaceutical education. Normal training was by way of the craft guild system of apprenticeship, a period as a journeyman and finally full mastership of one's craft. Organised full-time college training did not become the norm until well after the Great War of 1914 to 1918, and then the expansion and development of schools of pharmacy set the pattern for the remainder of the twentieth century. Amongst the leading pharmaceutical teachers during this period of rapid development was my mentor and friend, George Edward Trease, a man of Nottinghamshire, pharmacognosist, pharmaceutical historian and educator.

Pharmaceutical education for the apprentices in the Nottingham area was initially under the aegis of the Nottingham and Nottinghamshire Chemists' Association, founded in 1868. This followed the pattern of similar regional organisations established in Aberdeen (1839), Colchester (1841), Birmingham (1847) and Liverpool (1849). Minutes books for the Nottingham association are extant from 1873 which stress the importance placed on the training and education of apprentices. At about this time (c.1870) the Nottingham Mechanics' Institute was campaigning for a civic college, and in 1873 the University of Cambridge initiated a successful series of Extension Lectures in the town. So successful in fact that Nottingham Corporation, aided by an anonymous bequest of £10,000, built and maintained in Shakespeare Street the University College which opened in 1881, although not formally recognised as such until 1903.

At first the pharmacy classes arranged by a sub-committee of the Chemists' Association in co-operation with the University College paid particular attention to chemistry and botany. In its own rooms at Britannia Chambers, rented at £10 a year inclusive of furniture and gasfire, the Association installed museum cases for drug samples in 1875 and a small library of 71 books in 1878. The Association moved into rooms in Shakespeare Street in 1887 and so was in close proximity to the embryo University College. Diplomatic overtures consolidated the relationship between the two. The classes in chemistry and botany were developed, and by 1891 dispensing classes were offered. Thus from its official opening by Prince Leopold, Duke of Albany, on 30 June 1881 the College provided instruction for local pharmacy apprentices using part-time teachers.

After World War I, at the instigation of the Ministry of Labour in 1919, some full-time pharmacy teachers were attached to the Chemistry Department under the leadership of Captain J.C.Jinks, Ph.C., who had trained at the "Square", and John Edmund Driver, an absent minded yet brilliant pure chemist.

So was produced a very successful sub-department that provided full-time training. One of their earliest students was Arthur Owen Bentley, ex-fighter pilot. When Jinks joined British Drug Houses Ltd. in 1922, Bentley was appointed in his place. As there was a need for many more pharmacists in the post-war era, an independent pharmacy department was instituted in 1925. At this point George Edward Trease enters the story.

Born in Nottingham in 1902 a few hundred yards away from the University College, George Trease was the eldest of three brothers, the youngest of whom was Geoffrey Trease, future author, lecturer and playwright, destined to be known and loved as a writer of children's books. The Trease brothers were educated at Nottingham High School.

On leaving the Science Sixth Form, George considered architecture and chemical engineering as careers but, in his own words, more or less drifted into pharmacy and was apprenticed, aged eighteen, in the retail pharmacy of John Beachall in Nottingham. In retrospect, he thought that his early memories of his maternal doctor grandfather preparing pills, and his recollections of using his paternal brewery manager grandfather's microscope subconsciously triggered his decision.

Of his apprenticeship he said that he received a good practical training and learnt to work hard. Although he often admitted preferring rugby to studying, having been the wing-three-quarter and captain of the 1st. Rugger XV at school, he continued his pharmaceutical education at the London College of Pharmacy. He passed the then oral examinations, registered as a pharmacist in 1924 and returned to Nottingham.

He enquired about obtaining the Pharmaceutical Chemist or "Major" Diploma at the University College, and was appointed as a student-demonstrator on the understanding that he would more or less prepare himself for the examination whilst acting as Bentley's assistant lecturer. He obviously impressed because he was appointed lecturer at the college in 1925, and remained there until retirement in 1967 with just one brief two year spell in London at the Commodities Intelligence Section of the Ministry of Economic Warfare during World War II.

He was one of the six candidates "majoring" in London in June 1925, as was Tom Clifford Denston another notable pharmacognosist. Still plodding the pathway of private study, Trease graduated as a Bachelor of Pharmacy (London) in 1932 in company with F.R.C.Bateson and Colin Gunn. All three were destined to become the heads of schools of pharmacy at Nottingham, Birmingham and Leicester respectively. Trease became a Fellow of the Linnean Society (1936), an Associate of the Institute of Chemistry (1937), and subsequently a Fellow of the Royal Institute of Chemistry by 1945.

When the young Trease joined the staff of the Nottingham University College, it was still sited in Shakespeare Street near the centre of the town, but like many schools of pharmacy of the time, it was not exactly an ideal place to commence an

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academic career. In 1928 the principal teachers in pharmacy were A.O.Bentley, (Head of Department and pharmaceutics), a talented and popular lecturer, administrator and author of the well-known *Textbook of Pharmaceutics,* Hubert A.Turner, (pharmaceutics), a newly appointed idiosyncratic and rather sarcastic individual but a good teacher, J.E.Driver (pharmaceutical chemistry) and G.E.Trease (pharmacognosy). Significantly zoology and physiology did not enter the syllabus until 1935, and pharmacology in 1948.

Fortunately in 1928, the inadequately housed and equipped pharmacy department moved to the new Highfields site as part of the University College of Nottingham, the gift of Sir Jesse Boot. On 20 August 1948, twenty one years later the charter of the University of Nottingham was granted. The extensive site enabled considerable expansion and today's splendid university is far removed from the initial building for which Lord Haldane had laid the foundation stone on 14 June 1922, and which was officially opened on 10 November 1928 by King George V accompanied by Queen Mary. Today it is the Trent Building in the centre of the campus, re-named in 1956 in honour of Lord Trent, the first Chancellor of Nottingham University.

A conscientous and reliable teacher, whose quiet and avuncular manner endeared him to all of his students, George Trease became a beacon in British pharmacognosy. His early attempts to engage in research were hampered by poor facilities and the need to use the ill-equipped and poorly ventilated laboratory when the students were absent. Nevertheless, he produced papers on "The uses of carbon tetrachloride" read at the British Pharmaceutical Conference at Leicester in 1926, "The constituents of crude drugs" (1926) and "The formula of Liquor Arsenicalis,B.P." (1928)

Early pharmacognosy teaching was mainly concerned with the recognition of crude drugs of natural origin. Trease realised that physical and chemical tests were essential, and so concerned himself with identities and tests. He published papers on "Filtered ultra-violet rays in analysis"(1930), "Notes on leguminous seeds" (1931), "Gums of the Tragacanth type"(1936), "Ceylon Cinnamon"(1938) and "A simple camera lucida for students"(1944). As the University expanded Trease with Evans, who joined the staff in 1947, became involved in more advanced research on the *Aspidosperma* and *Rauwolfia* species with Adderson, Court, Jeffries and Kulkarni.[1]

Realising early in his career the critical shortage of reliable, up-to-date textbooks, he produced in 1928 with his chemist colleague, J.E.Driver, *The Chemistry of Crude Drugs* which received a very favourable review in the *Pharmaceutical Journal.*(1928,120:592)

In the following year, Trease published *Aids to Pharmaceutical Latin,* a necessary textbook at a time when Latin still dominated the prescription pad. This little book, proof-read by his brother Geoffrey, was intended to give pharmaceutical and medical students a concise Latin grammar specially adapted to their needs. It assumed no prior knowledge summarising the essential features of Latin grammar using pharmaceutical examples. The section on phrases and abbreviations found in prescriptions guided many students, myself included, to success in practical dispensing. An excellent pharmaceutical vocabulary completed a valuable contribution to pharmaceutical education.

However, his greatest contribution was yet to come. In the period 1920 to 1950 it was not unusual for a lecturer to teach many disciplines and demonstrate a versatility seldom encountered today. Thus it was that Trease embarked on his *magnum opus,* first published in 1934, *A Textbook of Pharmacognosy* in which he provided the student with a comprehensive survey of the commonly used drugs of natural origin.

Much of the success of the book stemmed from the author's obvious care and attention to detail. In his reminiscences, Trease referred in particular to his close collaboration with Harold O.Meek who in the 1930s was in charge of the purchase and standardisation of crude drugs at Boot's factory, and had wide experience of the problems involved. I learnt much from Meek in my undergraduate days when he acted as a tutor in Nottingham University.

Despite the somewhat grudging review by T.E.Wallis in the *Pharmaceutical Journal* (1934,133:708), Trease's book has now reached its thirteenth edition.[2] William Charles Evans was a young but capable demonstrator in Trease's department in 1947, the year I arrived in Nottingham as an ex-service undergraduate on the London University B.Pharm. course. Like Trease, Dr Evans was to spend his whole academic life at Nottingham, becoming Reader in Phytochemistry and co-author of the nineth and later editions of Trease's textbook.

The book's durability is undoubtedly due to the manner in which its authors have reflected the changes in pharmacognostical attitudes. They moved from the old macroscopical/microscopical approach, so skilfully developed by Dr Thomas Edward Wallis (1876-1973) in the museum and laboratories of the Pharmaceutical Society, to the current phytochemical emphasis effectively demonstrated by Evans himself in his series of studies of the solanceous *Datura* species. A fourteenth edition of the book is currently in preparation.

A.O.Bentley, who had been heavily committed in the O.T.C. and Home Guard, died suddenly in 1943 whereupon George Trease was appointed Head of the School of Pharmacy. He received the additional title of Reader in Pharmacognosy in 1945, Director of Pharmaceutical Studies in 1949, and finally that of Professor of Pharmacognosy in 1957.

The task of steering a tiny school of pharmacy into the mainstream of university life was not an easy one. Initially, the pharmacy staff were the teachers of pharmaceutics and pharmacognosy, and the remainder of the curriculum such as microbiology, physiology and chemistry was supplied by service teaching from other departments. It is to Trease's credit that in his quiet way he succeeded in bringing pharmaceutical chemistry, pharmacology and microbiology

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into a united school of pharmaceutical studies. There was considerable opposition from vested interests in other departments and much criticism of pharmacy as a shopkeeper's discipline that belonged to the technical school and not to a university.

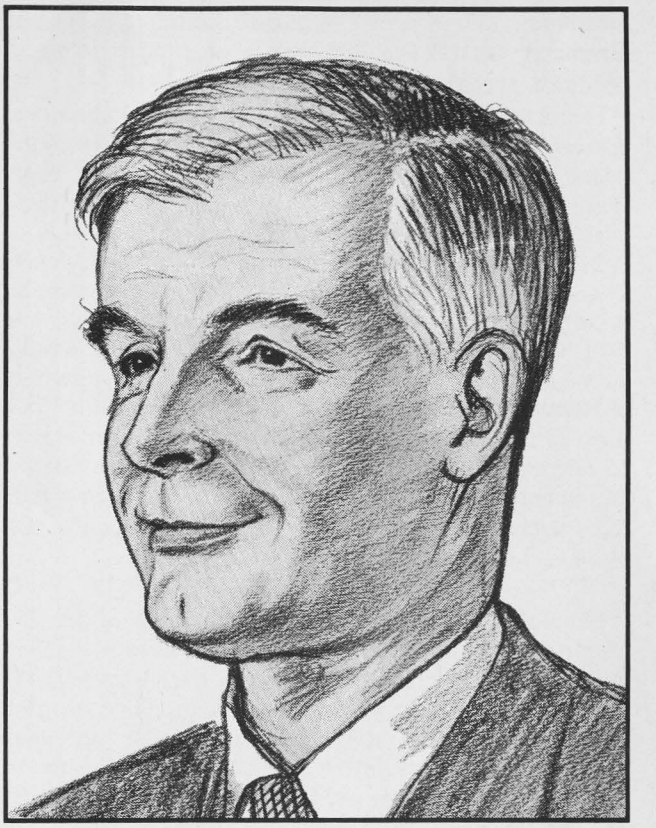
As a student I was aware of the political struggles taking place. There was a clear differentiation between the non-pharmaceutical service teachers and the pharmacy staff which then comprised four lecturers.[3] Trease's efforts were consolidated in 1954 by the endowment of the "Lord Trent Chair of Pharmaceutical Chemistry" by Boots who stressed their wish to strengthen the study of pharmacy within the University and to encourage research. The appointment of Dr Maurice W.Partridge to this Chair in 1960, despite both internal and external opposition, ensured the status of pharmaceutical chemistry as an integral part of the School of Pharmacy.

Under Trease's guidance the prescribed courses for the Pharmaceutical Society's one year Diploma (until 1951), the two year Diploma (until 1958) and the University of London External B.Pharm. (until 1949) were successfully provided. From 1948 onwards the University of Nottingham offered its own pass degree in pharmacy, and from 1956 an honours degree. Trease had thus, with his customary quiet diplomacy, engineered the transition from the technical school providing tuition for externally prescribed and assessed courses to the autonomous university school in full control of its courses and their internal and external moderation.

During his working life, the department produced about a thousand Chemist and Druggists, 99 Pharmaceutical Chemists, 88 Bachelors of Pharmacy (London), nine Bachelors of Pharmacy (Nottingham), four Doctors of Philosophy (London) and thirteen Diplomates of Biochemical Analysis. He also witnessed the metamorphosis from a school always looking for students and ever grateful to Boots for their annual ten scholarship apprentices, who acted as pace-makers, to a university department that could pick and choose from students queuing to join.

Apart from his roles as pharmacognosist and administrator, Trease was a keen pharmaceutical historian. Perhaps the nature of pharmacognosy encourages a deeper interest in pharmceutical history. When a Committee for the History of Pharmacy was formed on 15 August 1952, George became a member.[4] This Committee met 37 times during which Trease served as chairman from 1955 to 1958 and also prepared his book *Pharmacy in History*, published in 1964.

Pharmaceutical historians were not pleased with the attitude of the Pharmaceutical Society's Council towards a history group within the Society, and decided to form an independent society. On 14 June 1967, in the presence of 35 persons with 27 apologies for absence, the British Society for the History of Pharmacy came into being. Its first officers were J.C.Bloomfield (President), Prof. G.E.Trease (Vice-President), Dr J.K.Crellin (Secretary) and L.G.Matthews (Treasurer).



Professor G.E.Trease as seen by the *Chemist and Druggist* in 1959

Between 1953 and 1974, Trease published at least ten papers on spicers, apothecaries and the evolution of pharmacy. Remarkably, in his retirement when he was 77, he began an informative series of 43 articles on "The pioneers of pharmacy and medicine" which included Allen, Bunsen, Curie, Davy, Dioscorides, Ehrlich, Galen, Koch, Lavoisier, Lister, Paracelsus, Phillips, Vauquelin and Withering.[5]

He also found time to serve on the Pharmacognosy Committee "A" that formulated the relevant parts of the *British Pharmaceutical Codex* in the 1959 and 1963 editions. In addition he served as chairman of the Nottingham Branch, spoke at local branch meetings and addressed student gatherings, his trade mark being a gavel made from a Cassia pod and a lump of Shensi Rhubarb. He was too an examiner in pharmacognosy for the Pharmaceutical Society from 1934 onwards, and for the universities of London, Belfast, Glasgow, Wales, Liverpool, Malaya, Nottingham and Benares, and the Pharmaceutical Society of Eire.

When the Franco-British Pharmaceutical Commission was operating to encourage good relations between French and British pharmacists, George Trease was prominent, lecturing at several French universities. His efforts not only developed an "*entente cordiale*" but also resulted in his personal recognition, honorary degrees of Docteur de l'Université being conferred on him by the Universities of

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Strasbourg (1954) and Clermont-Ferrand (1962). At Strasbourg he was the first British pharmacist to be so honoured since Professor H.G.Greenish in 1917.

Trease wrote a number of letters to the *Pharmaceutical Journal.* His pharmacognostical letters concerning Socotrine Aloes, Frankincense, Myrrh, Asafoetida and Jalap resins clarified the nomenclature and commercial sources of these crude drugs; another indicated the wartime cultivation of Belladonna in the university grounds. His historical letters similarly clarified problems concerning the Garner families in early Nottingham pharmacy, Ching's Worm Lozenges and the Ching family in Cornwall, the Montpelliers and Writtle, the value of Ginger in mediaeval times, as well as the identity of Napoleon's apothecary. His final letter, written in 1985, revealed that his pharmaceutics knowledge was still active; he referred to his doctor prescribing glyceryl trinitrate for him in hundred packs when ones of twenty would have been more stable. He also noted that black labelling on a dark blue mouthwash bottle did not help an old man.

George was a family man with two daughters, Jill and Virginia, and a son Christopher. It was a terrible shock to George and his wife Phyllis when in the mid 1960s the news broke that their son, an undergraduate reading Mechanical Sciences at Balliol, was missing, presumed killed in the Mount Ararat area of Turkey. Months of anxious waiting followed but the mystery of his disappearance was never solved.

Shortly afterwards, in 1967, George and Phyllis moved to Crediton, living appropriately on George Hill. From then onwards George was rarely seen at pharmaceutical meetings although I discovered when I visited him in 1978 that he was still using the library in the University of Exeter for reference amendments and new entries for his *Textbook* and for historical articles - without using spectacles. Pharmaceutical history, local history and the genealogy of his Cornish background were now his interests.

Recalling his long academic experience, George often spoke fondly of the 1930s close-knit community of staff and students. In the 1970s, he questioned whether students should attend universities so far from their homes, whether there should be bars on the campuses, whether mixed halls of residence really contributed to community spirit and whether sensible rules were formulated and then properly enforced. He considered himself fortunate to have retired before the rapid expansion of the universities resulted in the anonymity of students and lecturers alike, twenty specialist lecturers taking the role of three all-rounders, and ten students becoming seventy to a hundred. The marked decline in manners and personal discipline resulting in drug taking, unnecessary demonstrations etc. needed, in his view, tougher control by the authorities or by the student body itself. Nevertheless, George was always an optimist and had great faith in the large majority of good, hard working students.

The good health that had carried him through the many battles of academic life failed him early in 1986 and he died on December 18th. in the same year, aged 84.

On a personal note, I shall remember George Trease as a good friend of almost forty years standing, a wise counsellor and a great facilitator. Needing to establish pharmacognosy research quickly in the Liverpool School of Pharmacy, I sought advice from two well known British pharmacognosists. One, rapidly damped my enthusiasm by suggesting that Liverpool was too far from London; the other, George Trease, said, "Come on over, Bill, and we will discuss it over lunch".

He must always be credited with the persistence and far-sightedness that laid the foundations of today's renowned School of Pharmacy in the University of Nottingham, and for producing the excellent textbooks so necessary at that time. George Edward Trease, pharmacognosist, historian and gentleman, was truly a man of his time.

Notes, References and Bibliography.

1. As author or part author, Trease was responsible for 26 papers and two textbooks on pharmacognosy.
2. Editions appeared in 1934, 1936, 1938, 1945,(re-printed 1946), 1949, 1952, 1957, 1961, 1966, 1972, (re-printed 1973), 1978, 1983; a Spanish edition was published in 1976 and an Italian one in 1993.
3. G.E.Trease and Mrs Mary Bolton (pharmacognosy), H.A.Turner and Miss Gertrude Mary Watson (pharmaceutics) and two demonstrators, W C.Evans and James Chilton.
4. The Committee comprised, L.G.Matthews (Chairman), Miss Agnes Lothian (Secretary), Howard Bayles, E.C.Cripps, A.J.Fairlee, W.H.Hampton, E.Saville Peck, J.M.Rowson and G.E.Trease; F.C.Wilson, (Council member) and F.W.Adams (Secretary and Registrar) represented the Pharmaceutical Society's interests.
5. His 43 pen portraits appeared in *Brit.J.Pharm.Pract.,Nos. 1-5.*
6. He wrote fourteen letter to the editor of the *Pharmaceutical Journal* on pharmaceutical, pharmacognostical and historical subjects.
7. Anon. 'Nottingham University', *Pharm.J.*,1952, 114:209-210.
   K.Brooke, 'The Nottingham Chemists' Association', *Pharm.J.* 123:157-158.
   L.G.Matthews, 'The History of the Pharmacy Committee of the Pharmaceutical Society,1952-1967',*Pharm.Hist.*Dec.1976,p.3-4
   Geoffrey R.Trease, *A Whiff of Burnt Boats -An early auto-biography*, London, Macmillan, 1971.

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